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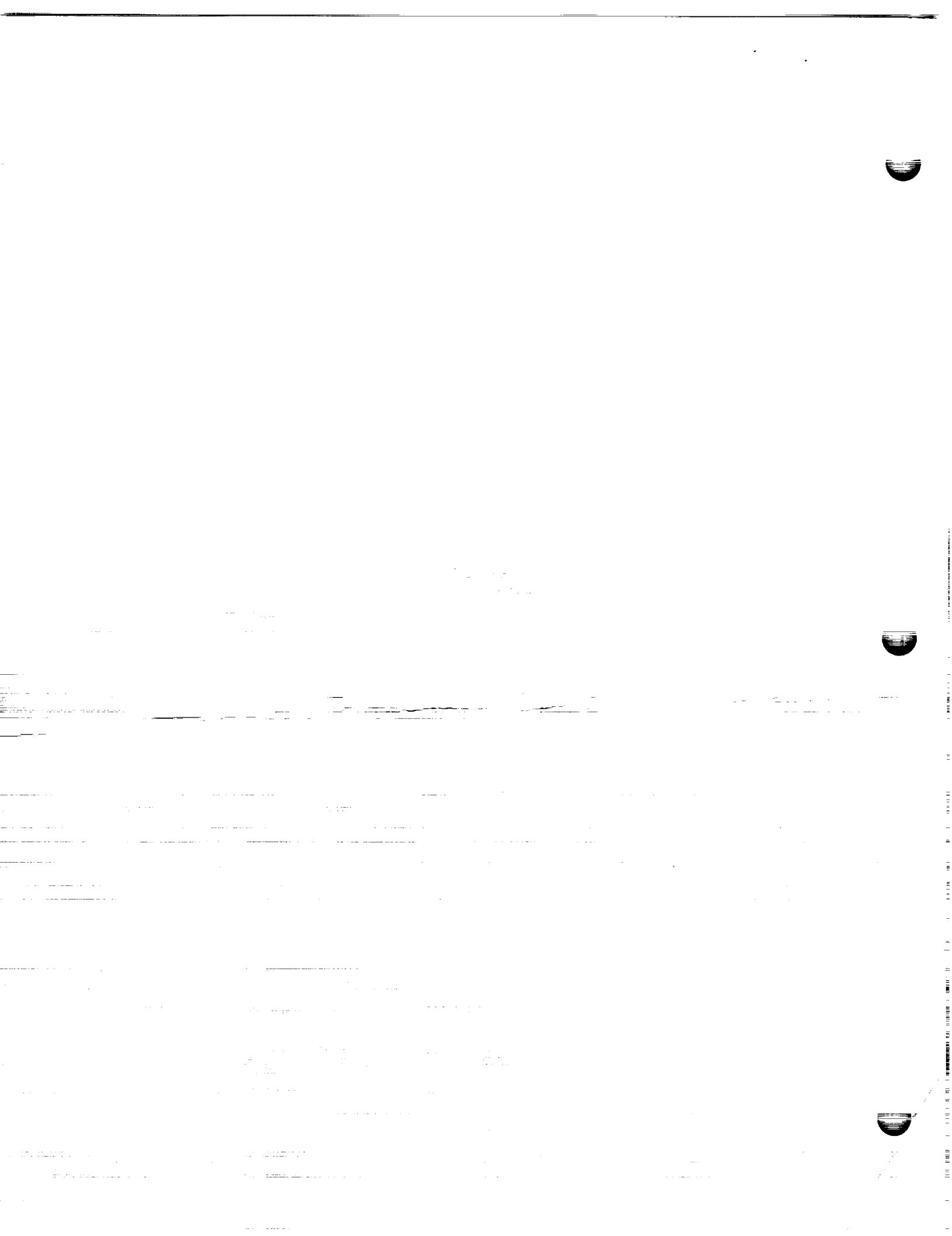
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National Aeronautics and
Space Administration
John F. Kennedy Space Center





**CHRONOLOGY OF KSC
AND KSC RELATED EVENTS
FOR 1992**

**BY KEN NAIL, JR.
KSC LIBRARY ARCHIVIST**

FOREWORD

This 1992 Chronology is published to fulfill the requirements of KMI 2700.1 (as revised) to describe and document KSC's role in NASA's progress. Materials for this Chronology were selected from a number of published sources. The document records KSC events of interest to historians and other researchers. Arrangement is by date of occurrence, though the source cited may be dated one or more days after the event.

Materials were researched and prepared for publication by Historian-Archivist Ken Nail, Jr. (EG&G FLORIDA, Inc.). The 1992 Chronology includes an index beginning on page 257. For the added convenience of researchers, each entry has been headlined. Comment on the Chronology should be directed to the John F. Kennedy Space Center, LIBRARY-E, Kennedy Space Center, Florida, 32899.


Walter L. Covington
Center Services



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JANUARY

January 1:

CRIPPEN BECOMES DIRECTOR TODAY

Robert L. Crippen, 54, becomes Kennedy Space Center's fifth director today; he was preceded by Dr. Kurt H. Debus, Lee Scherer, Richard G. Smith and Forrest S. McCartney. KSC Launch Director Robert B. Sieck said, "Crip understands the work environment down here, the priorities and the critical areas because he was here for years [1986-1989]. That knowledge I think he will apply to his management style as he becomes shepherd of all of this." Crippen joined NASA as an astronaut in 1969 and flew as pilot in April 1981 on Columbia's first flight; later he commanded three Shuttle missions. He is the first former astronaut to become a NASA field center director; Crippen is no longer on active flight status. Norman Parinet, Chairman of NASA's Aerospace Safety Advisory Panel, said, "I like Bob Crippen very much. I don't always agree with what he does, but that's part of the game. He's his own man." [Banke, FLORIDA TODAY, p. 1A, Jan. 1, 1992, Brown, FLORIDA TODAY, pp. 10E & 9E, Dec. 29, 1991.]

January 2:

STS 42: DISCOVERY UPDATE

At Launch Complex 39A, hydraulic tests have been completed on Discovery's solid rocket boosters (SRBs). Work in progress: post-holiday deconfiguration; preparations for electrical power up; preparations for loading of hypergolic fuels next week; launch pad validations; helium signature test preparations; power reactant and storage distribution system T-0 checks. Work scheduled: main engine frequency response test; helium signature test; terminal countdown demonstration test (January 6-7); crew arrival (January 5); flight readiness review (January 9). The International Microgravity Laboratory is in the Orbiter payload bay and has been closed out for flight. The payload bay doors are not scheduled to be opened prior to flight. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 2, 1991.]

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PROCESSING UPDATE: ATLANTIS

Auxiliary Power Unit 2 has been removed from Atlantis in OPF Bay 2 and the removal of APU 1 is underway. Other activities now in progress: heat shield removal for inspection; resumption of SRB stacking operations in the VAB; continuation of closeouts of solid rocket booster joints. Scheduled work: lower main landing gear and opening the payload bay doors. Testing of NASA's Atmospheric Laboratory for Applications and Sciences is complete and closeouts have begun. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 2, 1991.]

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OPF HIGH BAY 1: ENDEAVOUR

Ku-band power amplifier tests and brake anti-skid tests have been completed on Endeavour in OPF Bay 1. Work in progress: thermal protection system operations; insulation of main propulsion system lines in the aft compartment; midbody closeouts. The INTELSAT rebooster perigee kick motor is scheduled to arrive at the Astrotech (Titusville, FL) facility for flight processing at the end of January. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 2, 1991.]

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COLUMBIA'S ONGOING MODIFICATIONS

The Space Shuttle Columbia remained powered up through the holidays, allowing work on the vehicle to continue. Structural inspections and tests in critical areas are part of the modifications and refurbishments scheduled for this week. Columbia is targeted for its ferry flight return to KSC around the end of January. Processing will then begin for its next mission, STS-50, the first extended duration Orbiter mission scheduled to last 13 days. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 2, 1991.]

January 3:

STS 42/ML PROCESSING

The post-holiday deconfiguration of Discovery at Launch Complex 39A has been completed along with SRB hydraulic tests and crew compartment vent door cycling and checks. Work in progress: electrical power up; main engine frequency response test and ball seal leak checks; preparations for loading of hypergolic fuels next week; launch pad validations; helium signature test preparations; power reactant and storage distribution system T-0 checks. Scheduled work: helium signature test; pre-launch propellant servicing; TCDT, LRR, FRR and launch of STS 42 in the third week of January. [KSC SHUTTLE STATUS REPORTS, 10:00 a.m., Jan. 3, 1991, "Workers Back at KSC," FLORIDA TODAY, p. 3A, Jan. 3, 1992.]

□

ATLANTIS IN OPF HIGH BAY 2

Testing of NASA's Atmospheric Laboratory for Applications and Sciences is complete and closeouts have begun in OPF High Bay 2. Atlantis' APU units 1 and 2 have been removed; hydraulic operations have been completed and the Orbiter's landing gear have been lowered. Work in progress: auxiliary power unit 3 leak and functional test; preparations for removal of main engines next week; main engine heat shield removal; preparations for installation of fuel cell 1; SRB stacking operations in the Vehicle Assembly Building; continuing closeouts of solid rocket booster joints in the VAB; water spray boiler checkout and service and forward reaction control system checkout and functional test. The payload bay doors are scheduled to be opened shortly. [KSC SHUTTLE STATUS REPORTS, 10:00 a.m., Jan. 3, 1991.]

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ENDEAVOUR IN OPF HIGH BAY 1

Endeavour's Ku-band power amplifier tests and brake anti-skid tests have been completed in OPF High Bay 1. Work in progress: electrical power up; electrical verifications; flash evaporator checks and water spray boiler servicing; main engine controller tests; thermal protection system operations; insulation of main propulsion system lines in Endeavour's aft compartment; midbody closeouts; main engine heat shield seal leak tests. Scheduled work: Ku-band system checks and APU leak and functional test. The INTELSAT reboost perigee kick motor is scheduled to arrive at the Astrotech (Titusville, FL) facility for flight processing at the end of January. [KSC SHUTTLE STATUS REPORTS, 10:00 a.m., Jan. 3, 1991.]

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COLUMBIA IN PALMDALE, CA

The Space Shuttle Columbia remains powered up as structural inspections and tests in critical areas continue. Managers will be meeting later next week to determine the

delivery date of the vehicle back to KSC. Columbia is targeted for its ferry flight return near the end of this month. Once back at KSC, processing will then begin for its next mission, STS 50, the first extended duration Orbiter mission scheduled to last 13 days. [KSC SHUTTLE STATUS REPORTS, 10:00 a.m., Jan. 3, 1991.]

II

TCDT BEGINS TODAY

Discovery's STS 42 crew will arrive at Kennedy Space Center today to take part in the two-day Terminal Countdown Demonstration Test which begins at 11 a.m. The crew includes Commander Ronald Grabe, Pilot Stephen S. Oswald, Mission Specialists Norman E. Thagard, David C. Hilmers and William F. Readdy and Payload Specialists Roberta L. Bondar (Canadian Space Agency) and Ulf Merbold (European Space Agency.) [Brown, FLORIDA TODAY, p. 1A, Jan. 5, 1992, Brown, FLORIDA TODAY, Jan. 6, 1992.]

January 5:

1992 SHUTTLE LAUNCH PLANS

Target dates for nine 1992 shuttle launches have been announced:

Jan. 22	Discovery STS 42	Seven astronauts on a seven-day mission carrying a pressurized Spacelab module configured as the International Microgravity Laboratory
March 14	Atlantis STS 45	Seven astronauts on an eight-day mission carrying Spacelab hardware configured as ATLAS-01, a laboratory for studying the sun and Earth's atmosphere.
April 9	Endeavour STS 49	Seven astronauts on a seven-day mission, the first voyage of NASA's newest Orbiter. Space-walking astronauts will rescue a stranded Intelsat 6 communications satellite.
June 3	Columbia STS 50	Seven astronauts on a planned 13-day mission, the first so-called Extended Duration Orbiter mission, which would be the longest in Shuttle program history. In the cargo bay will again be a pressurized Spacelab module configured as the United States Microgravity Laboratory.
July 2	Atlantis STS 46	Seven astronauts on a seven-day mission carrying the Italian Tethered Satellite System experiment and EURECA, a European Space Agency pallet of experiments that will be deployed then retrieved six months later during another Shuttle flight.

August 12	Endeavour STS 47	Seven astronauts on a seven-day mission with a Spacelab configured with experiments sponsored by Japan. The mission will feature Mark C. Lee and N. Jan Davis, the first married astronaut couple to fly in space together.
Sept. 24	Columbia STS 52	Six astronauts on a nine-day mission carrying the Laser Geodynamics Satellite, a passive spacecraft that will reflect laser beams shot from Earth so scientists, for example, can measure movement in the planet's crust.
Oct. 15	Discovery STS 53	Five astronauts on a four-day mission to deploy a secret Defense Department satellite, believed to be an advanced photo reconnaissance spacecraft.
Dec. 3	Endeavour STS 54	Five astronauts on a six-day mission to deploy NASA's fifth Tracking and Data Relay Satellite.

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CRIPPEN TO MAKE ROUNDS IN BREVARD

Incoming KSC Director Robert L. Crippen has a full round of meetings scheduled, starting with an afternoon press conference tomorrow (January 6). Crippen will also address the space center's 20,000 employees on the 6th. Over the next three weeks, he will meet with community leaders throughout Brevard County including the Florida Space Business Roundtable headed by former U. S. Rep. Bill Nelson and Lyle Holloway of McDonnell Douglas' Delta launch team. [New KSC Director Begins His Rounds in Brevard, "FLORIDA TODAY, p. 9E, Jan. 5, 1992; Glisch, THE ORLANDO SENTINEL Jan. 7, 1992.]

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STS 42 CREW ARRIVES AT KSC

The crew of Discovery's STS 42 mission arrived at Kennedy Space Center today for a two-day practice countdown. "We're really pleased to be here. NASA has a very ambitious 1992 on its schedule, and we're just proud and excited to be the first ones up," said Commander Ronald Grabe. "We're really anxious to get on with our launch," he added. The crew includes: Pilot Stephen S. Oswald, Mission Specialists Norman E. Thagard, David C. Hilmers and William F. Readdy and Payload Specialists Roberta L. Bondar and Ulf Merbold. The practice countdown begins January 6 and concludes with a mock launch on January 7. [Astronauts Arrive at KSC, "FLORIDA TODAY, p. 1A, Jan. 6, 1992, Brown, FLORIDA TODAY, p. 4A, Jan. 6, 1992; Halvorson, FLORIDA TODAY, Jan. 7, 1992.]

January 6:

STS 42: MAIN ENGINE TEST DONE

Discovery's main engine flight readiness test for its upcoming STS 42 mission has been completed at Launch Complex 39A. Work in progress: Terminal Countdown Demonstration Test (TCDT); T minus zero is planned at 11 a.m. tomorrow with a simulated main engine cutoff; STS-42 flight crew emergency egress training at the launch pad; helium signature leak test of the three main engines and main propulsion system; preparations to load hypergolic propellants on board the Orbiter for use by the in-flight engines and thrusters; Launch Readiness Review. Scheduled work includes: STS 42

crew wake up at 6 a.m. and crew departure from the O & C Building at 7:45 a.m. January 7; crew arrival at LC 39A at 8:15 a.m.; the crew will depart for Johnson Space Center after the TCDT; loading hypergolic propellants into the Orbiter set to begin January 8 and continue through January 10; the Flight Readiness Review is planned for January 9 and launch remains targeted for the third week in January. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 6, 1992.]

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STS 45: ATLANTIS PROCESSING

Work in progress on the Space Shuttle Atlantis includes: electrical and mechanical connection of fuel cells 1 and 2; functional testing of the forward reaction control system; installation of the Orbiter's brakes in preparation for its STS 45 flight; inspections of the radiators; reinstallation of several reinforced carbon T-seals and panels on the leading edges of the wings; the seals have successfully passed inspections and are in good condition; preparations to remove the three main engines; stacking of the right forward assembly in the Vehicle Assembly Building. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 6, 1992.]

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ENDEAVOUR IN OPF BAY 1

In Orbiter Processing Bay 1, Endeavour continues to be prepared for its debut flight in April. Work in progress: inspections of the liquid hydrogen 17-inch disconnect umbilical; leak and functional tests of the flash evaporator system; closeouts of the midbody; installation of tiles around the nose landing gear; preparations to service the Orbiter with potable water; thermal protection system operations. Scheduled work includes systems testing of the microwave scanning beam landing system and structural leak checks of the drag chute pod. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 6, 1992.]

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KSC: JOB CUTS PLANNED

By 1996 there will be 5,000 fewer jobs at Kennedy Space Center, according to NASA officials. That represents a 20 percent cut in the 25,000-member workforce. The drop in KSC employment will come in one of three ways: shifts of contract employees from Shuttle to Space Station; attrition; layoffs. New KSC Director Robert L. Crippen, who held his first press conference as director, said, "Five-thousand (jobs) would be significant to be done by attrition across the program. I believe there will have to be reductions to accomplish those kinds of numbers." NASA plans to cut its employment by 3 percent a year for the next five years. "It's not going to occur all at once," said Crippen. "We're trying to do it in 3 percent bites. We do want it to occur gradually." The employment shift is part of NASA's plan to shift its focus from the Shuttle Program to new projects which the agency has in store for the next century. "Why are we doing it?" Crippen asked rhetorically. "The why is that it is NASA's ambition - and rightfully so - to be doing other exciting things and exploring new horizons. That includes building space station Freedom; it includes going back to the moon and erecting a lunar base, and then sending people on to Mars. All of those things cost money, and there aren't going to be many new bucks for NASA to work with," he said. "Consequently, we need to be able to reduce programs like Shuttle - but do it safely - so that we can do these other exciting things." Crippen also referred in his press conference to NASA's plan to fly as many as nine Shuttle missions this year. "It's a real challenge to be able to talk about the flight rate that we're talking about and do it safely, yet still be able to do it more economically." [Halvorson, FLORIDA TODAY, pp. 1A-2A, Jan. 7, 1992, "NASA to Cut 5,000 Space Shuttle Jobs in 5 Years," THE NEW YORK TIMES, p. A12, Jan. 8, 1992.]

January 7:

TCDT: HILMERS FOURTH TIME

"This is the fourth time around for me, but it never gets old," said astronaut **David C. Hilmers** about his participation in the pre-launch Terminal Countdown Demonstration Test for STS 42. "Every time I come out here for one of these countdown demonstration tests, the old adrenalin gets flowing and the butterflies start to churn around in the stomach." Hilmers and his crew mates have been training for this mission for two years. "We're looking forward to coming back here in two weeks and doing it," he said. The other members of the STS 42 crew are: Commander **Ronald Grabe**, Pilot **Stephen S. Oswald**, Mission Specialists **William F. Readdy** and **Norman E. Thagard** and Payload Specialists **Roberta L. Bondar** and **Ulf Merbold**. [Halvorson, FLORIDA TODAY, p. 2A, Jan. 7, 1991.]

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STS 42: LRR COMPLETED

The Launch Readiness Review for Discovery's STS 42 mission has been completed; there are no significant issues or concerns. Kennedy Space Center spokesman **Mitch Varnes** reported, "Everything went as planned in today's countdown test for the upcoming launch of Discovery. The managers feel we have a healthy vehicle and are on schedule for a launch later this month." Discovery's helium signature leak test and the STS 42 flight crew training at Launch Complex 39A have also been completed. Launch Complex 39A will be closed late today to nonessential personnel during the loading of toxic propellants. Work in progress: Terminal Countdown Demonstration Test (TCDT) concluded today on schedule at 11 a.m. with a simulated main engine cutoff and preparations are underway to load hypergolic propellants on board the Orbiter for use by the in-flight engines and thrusters. Scheduled work: STS 42 flight crew departure this afternoon; loading hypergolic propellants beginning today and through Friday (January 10); the Flight Readiness Review for STS 42 begins January 9. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 7, 1992, Banke, FLORIDA TODAY, p. 4A, Jan. 8, 1992.]

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ATLANTIS' HEAT SHIELDS REMOVED

In OPF Bay 2, technicians have removed the heat shields from around the three main engines of Atlantis. Work in progress: leak checks of helium regulators in the midbody of the Orbiter; tests of the Ku-band antenna; electrical and mechanical connection of fuel cells 1 and 2; functional testing of the forward reaction control system; installation of the brakes; inspections of the radiators; reinstallation of several reinforced carbon T-seals and panels on the leading edges of the wings - the seals were inspected and are in good condition; disconnecting the three main engines from the orbiter. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 7, 1992.]

January 9:

FRR OPENS

Kennedy Space Center hosts the STS 42 Flight Readiness Review today at which government and Shuttle contractor managers will set an official launch date for Discovery's mission; current plans target January 22 for liftoff. Officials noted that the schedule still has three days of padding in it so the launch date might be moved up. At Launch Complex 39A, workers continue loading toxic propellants into onboard storage tanks; this operation is expected to be concluded January 10. At LC 39A, workers repaired tiled on the Orbiter's underside. [Banke, FLORIDA TODAY, p. 2A, Jan. 9, 1992, KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 9, 1992, Campion & Malone, Note to Editors: NASA Managers Set Launch Date for STS 42, Jan. 9, 1992.]

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ATLANTIS PROCESSING REPORT

All three main engines have been removed from Atlantis in OPF Bay 2. In addition, the Orbiter's Nose landing gear wheels have been mounted and the Main Propulsion System 4-inch quick disconnect line has been inspected and found to be in good shape. Work in progress: voltage tests of the fuel cells; tests of the Ku-band antenna; reinstallation of T-seals on the leading edges of the wings; main landing gear wheels are being mounted. **[KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 9, 1992.]**

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ENDEAVOUR: HATCH SEAL REPLACED

In OPF Bay 1, technicians have replaced and completed an initial fit check an air lock hatch seal on Endeavour. Work in progress: midbody closeouts; thermal protection system operations and leak checks of the environmental control life support system. **[KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 9, 1992.]**

January 10:

IML IN DISCOVERY PAYLOAD BAY

The International Microgravity Laboratory is in Discovery's payload bay and has been closed out for flight and the bay doors are not scheduled to be opened prior to flight. Some middeck experiments are being prepared for installation aboard the vehicle just prior to flight. Work in progress: loading hyperbolic fuels on Orbiter and solid rocket boosters and preparations for ordnance operations next week. Work scheduled: troubleshooting of electrical connections between Orbiter avionics bay and helium isolation valve on engine number 3; ordnance installation January 13. **[KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 10, 1992.]**

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ATLANTIS IN OPF BAY 2

Testing of NASA's Atmospheric Laboratory for Applications and Sciences is complete and closeouts have begun in preparation for Atlantis' STS 44 mission; voltage tests on fuel cells have been completed. Work in progress: preparations for removal of helium tank next week; water spray boiler checkout, service, leak and functional tests; preparations for installation of main engine; auxiliary power unit hot lube oil flush preparations; solid rocket booster stacking operations in the Vehicle Assembly Building and continuing closeouts of SRB joints in VAB. Work scheduled: installation of main engines and removal and replacement of helium tank. **[KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 10, 1992.]**

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INTELSAT SCHEDULED TO ARRIVE

Endeavour's main payload for its maiden STS 49 mission - the INTELSAT reboost perigee kick motor - is scheduled to arrive at the Astrotech (Titusville, FL) facility for flight processing at the end of this month. The Orbiter has had its gaseous oxygen flow control valve installed. Work in progress: electrical verifications; flash evaporator checks and water spray boiler servicing; fuel cell checks; thermal protection system operations; insulation of main propulsion system lines in aft compartment; midbody closeouts and blanket installation; left hand external tank door checks and inspections. **[KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 10, 1992.]**

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COLUMBIA UPDATE

The Space Shuttle Columbia remains powered up as structural inspections and tests in critical areas continue. Managers will be meeting today to determine the delivery date of the vehicle back to KSC. Columbia is targeted for its ferry flight return near the end of the month or early next month. Once back at KSC, processing will then begin for its next mission, STS 50, the first extended duration Orbiter mission scheduled to last 13 days. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 10, 1992.]

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SAFETY AND SHUTTLE LAYOFFS

U. S. Rep. Jim Bacchus (D-Orlando, FL) wants Congress to investigate the impact of NASA's planned layoffs on Shuttle safety. He said, "We must not permit pressure for cost-cutting or the desire for increased efficiency to undermine our commitment to safety as our paramount priority. I have quite a few questions, and I intend to ask them. However NASA restructures or consolidates Shuttle activities, it must not be done in a way that undermines our ability to fly safely. My impression is that the Shuttle processing activities since Challenger have worked very well. And in restructuring or consolidating I don't want to break up a team that has been working very well." New KSC Director Robert L. Crippen, speaking to the space center workforce January 6, said that he has made flight safety the most important issue of his tenure. "There have been some insinuations that my arrival here at KSC was going to put a different focus on safety," Crippen said. "Well...read my lips. Safety is our No. 1 concern and it will remain so." [Halvorson, FLORIDA TODAY, p. 1A, Jan. 11, 1992.]

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AMBASSADOR TO LEAVE KSC

The Ambassador, a full-scale replica of a Space Shuttle Orbiter, will soon depart Kennedy Space Center after being toured by nearly 2 million visitors during its year-long stay at KSC's Spaceport USA. The highly popular, free exhibit is scheduled to remain on display at Spaceport USA through January 19. Ambassador's owners Irvin and Kenneth Reid Productions, Inc., have plans to send the high-fidelity replica Orbiter overseas. Under a lease agreement between the owners and TW Recreational Services, Inc., operators of Spaceport USA for NASA, the Ambassador arrived in December 1990 for an expected stay of four months. The lease was extended until this month due to a change in the owner's plans. "This has been a super exhibit," said Ed Harrison, Chief of KSC's Visitor Center Office. "We're delighted so many people have had the opportunity to see what a Shuttle Orbiter really looks like, both outside and in. We hope those who haven't had a chance to see it will have an opportunity before it leaves." Due to the popularity of Ambassador, NASA and TWRS are developing plans for a permanent replica Space Shuttle Orbiter. [NASA/KSC NEWS RELEASE NO. 3-92, Jan. 10, 1992, Hall, FLORIDA TODAY, p. 1B, Jan. 11, 1992.] Kennedy Space Center Spaceport USA News Release NT05 95, Jan. 10, 1992; Reitz, FLORIDA TODAY, p. 2B, Jan. 20, 1992.]

January 12:

MINOR VALVE PROBLEM: DISCOVERY

"We don't have any reason to be pessimistic yet," said KSC Bruce Buckingham regarding test which last week revealed a valve that regulates the flow of helium to main engine No. 3 was not working as it should. The problem has not repeated during subsequent tests and workers do not understand why the valve failed to work properly the first time. Officials have determined that the valve is not a risk to spaceflight because helium can be delivered to the main engines in a number of ways. More tests will be conducted on

January 13; routine preparations continue with the next major task being the completion of ordnance installation. [Banke, FLORIDA TODAY, p. 1A, Jan. 13, 1992, Banke, FLORIDA TODAY, p. 3A, Jan. 13, 1992.]

January 13:

ORDNANCE INSTALLED: DISCOVERY

After Shuttle managers reviewed tests on a potentially faulty helium valve, Discovery was cleared for launch on its STS 45 mission January 22. "We retested it and everything checks out. It's go for flight; we're on schedule," said Kennedy Space Center spokeswoman Lisa Malone. Shuttle managers are treating the problem with the valve as an unexplained anomaly and the Orbiter will fly as it is. There is no concern about the safety of the launch because the valve is part of a redundant system that provides helium to the engines. The crew is expected to arrive at KSC at 9:00 a.m. on January 19; the countdown to launch begins at 1:00 p.m., said Malone.

Installation of ordnance devices on Discovery have been completed at Launch Complex 39A; successful replacement and retest of wiring for a valve between the helium supply tank and the No. 3 main engine in preparation for STS 42 have been completed as well. Work in progress: preparations to install the two contingency space suits into the Orbiter's airlock; launch countdown preparations; close outs of the avionics bays in the aft compartment; cleaning of the aft compartment; final preparations of the auxiliary power units and hydraulics system; initial close outs of the three main engines. Work scheduled: purges of the external tank January 14; close out the aft engine compartment for flight January 17; crew arrival January 19; launch countdown begins January 19 with launch at 8:53 a.m. EST, January 22. [KSC SHUTTLE STATUS REPORT, 11 A. M., Jan. 13, 1992, Banke, FLORIDA TODAY, p. 2A, Jan. 14, 1992.]

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ATLANTIS: STS 45 PROCESSING ACTIVITIES

The three main engines of Atlantis have been installed as have been the waste containment system and the main landing gear tires. Atlantis is being readied for its STS 45 mission in OPF Bay 2; the following activities are on the current processing schedule: installation of auxiliary power units 1 and 2; functional testing of the orbital maneuvering system and reaction control system; leak and functional tests of the water spray boilers and of the waste containment system; calibration of the inertial measurement system. [KSC SHUTTLE STATUS REPORT, 11 A. M., Jan. 13, 1992.]

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ENDEAVOUR: LEAK CHECKS OF WATER SYSTEM

In Orbiter Processing Facility Bay 1, Endeavour has had its potable water system checked for leaks. Work in progress includes: full testing of the external tank latches; functional test of the crew module side hatch; leak tests of the crew cabin, environmental control life support system and flash evaporator system; closeouts of the midbody; installation of tiles; thermal protection system operations. [KSC SHUTTLE STATUS REPORT, 11 A. M., Jan. 13, 1992.]

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COLUMBIA MODIFICATIONS UPDATE

Power up work this week on Columbia includes tests of the auxiliary power units and the environmental control life system. Work is continuing to install the regenerable carbon dioxide removal system in the middeck. Modifications to install the drag chutes are continuing. The extended duration orbiter pallet is scheduled to arrive at KSC today by

C5 aircraft; the pallet will be transferred to the VAB high bay 2 for storage and checkout. Columbia is targeted to return to Florida on February 8; there will be a two-day ferry flight from California to Florida beginning February 7. [KSC SHUTTLE STATUS REPORT, 11 A. M., Jan. 13, 1992.]

January 14:

DELAY FOR ENDEAVOUR?

NASA may have to delay the maiden launch of Endeavour, the newest Space Shuttle. "We're reviewing our schedules right now and how much work we have left in the hangar and how much time we need to complete that work," said Lisa Malone, a Kennedy Space Center spokesperson. Workers put in voluntary overtime to help overcome as much as a six-week processing delay for the Orbiter. If Endeavour were on time, it would be rolled over to the VAB on February 14 and rolled out to Launch Complex 39B on February 21. Managers will meet January 15 to determine new target dates for these processing milestones. The NASA headquarters launch schedule shows a May launch date for Endeavour. [Banke, FLORIDA TODAY, p. 2A, Jan. 15, 1992, Banke, FLORIDA TODAY, p. 1A, Jan. 16, 1992.]

January 16:

ORDNANCE OPERATIONS COMPLETED

Final ordnance operations have been completed on Discovery prior to the launch of its STS 42 mission on January 22. Work in progress: pressurization of the hypergolic propellant tanks for flight; launch countdown preparations; preparation of the avionics bays in the aft compartment for flight; cleaning of the aft compartment; final preparations of the auxillary power units and hydraulics system; closeouts of the three main engines. Scheduled work includes: removal of service platforms from the launch platform; close out of the aft engine compartment for flight tomorrow; STS 42 flight crew arrives January 19 at 9:00 a.m.; launch countdown begins at 1:00 p.m. on the 19th and launch is targeted for 8:53 a.m. January 22. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 16, 1992.]

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ATLANTIS STS 45 PROCESSING ACTIVITIES

Technicians working in OPF Bay 2 have finished filling and bleeding the hydraulic system of the Space Shuttle Atlantis. Activities in progress: testing of the nose wheel steering system and the communications system; functional testing of the orbital maneuvering system, reaction control system and the waste containment system; checkout of two newly installed helium tanks for the main propulsion system; configuring of the payload bay for the STS 45 payloads and leak and functional tests of the water spray boilers. The ATLAS payload is scheduled to arrive at the Orbiter Processing Facility on January 22. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 16, 1992.]

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ENDEAVOUR'S PROCESSING ACTIVITIES

Among the activities underway in OPF Bay 1 in the processing of the Space Shuttle Endeavour are the following: removal of the main landing gear roll around tires and installation of flight tires; tests of the main propulsion system's gaseous oxygen system; sampling and adjusting of the water loops; structural leak checks of the drag chute pod; leak tests of the crew cabin; leak checks of the environmental control life support system; leak and functional tests of the flash evaporator system; closeouts of the midbody; installation of tiles; thermal protection system operations; fit checks of the Orbiter's waste containment system. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 16, 1992.]

COLUMBIA'S MODIFICATION PROGRESS

Final preparations are being made on Columbia to finish the modification work planned at Palmdale, CA. Technicians are completing work on wire trays in the midbody of the Orbiter. Closure of the payload bay doors is scheduled this weekend; final tests of the hydraulic system are planned. Work is continuing to install the regenerable carbon dioxide removal system in the Orbiter; modifications to install the drag chute are continuing. The mock orbital maneuvering system pods are scheduled to be installed late next week and the tail cone is targeted for installation late this month or early next month. The chin panel and the forward reaction control system simulator have been installed already. The extended duration Orbiter pallet is being stored in the VAB high bay 2 where it will be checked out for installation in Columbia's payload bay. The return of Columbia is planned for February 8 at the end of a two-day ferry flight from California. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 16, 1992.]

January 17:

RAILROAD SYSTEM CONTRACT AWARDED

Railroad Track Construction Corp. (St. Augustine, FL) has been awarded a three-year, \$2,889,826 contract to maintain the 40-mile railroad system at Kennedy Space Center. The contract is the third the firm has received for providing this service to the space center. The first contract was awarded in 1983; under the terms of the contract, the company maintains the tracks, right-of-way, grade crossings and crossing signals. The 12-mile main line of the KSC railway is primarily used to transport Space Shuttle solid rocket booster (SRB) segments that arrive from Utah. This part of the railway runs from a point where it meets the Florida East Coast Railway two miles north of Titusville to a distribution and handling facility just north of the Vehicle Assembly Building. From the distribution center, the segments are transported by truck to the VAB. Once in the VAB, four segments are assembled to make up one of the Shuttle's two SRBs. After launch, the spent boosters are recovered, refurbished and sent back as individual segments to Utah. The rest of the railroad includes track west and south of the VAB to the Locomotive Maintenance Facility, as well as northeast to Space Shuttle Launch Pads 39A and 39B. From the pads, the line runs south along the Atlantic coastline to Cape Canaveral Air Force Station (CCAFS). The KSC railroad is also used to transport other fuels for the Shuttle and additional space hardware for both NASA and CCAFS, the site of commercial unmanned rocket launches. [NASA/KSC NEWS RELEASE NO. 7-92, Jan. 17, 1992.]

January 17:

TANKS READIED FOR FLIGHT

"We're still right on schedule," said Kennedy Space Center spokeswoman Lisa Malone of the pre-flight preparations being made at Launch Complex 39A. KSC's Payload Manager Mike Kinnan said, "We're looking good and we'll be ready to go next week." Discovery's hypergolic propellant tanks have been pressurized for its STS 42 mission which begins at 8:53 a.m., January 22. Work in progress: launch countdown preparations; removal of thruster covers from the reaction control system; stowing flight crew equipment in the middeck; tests of the leak detectors and hazardous gas system at the launch pad; washing down the mobile launcher platform and flame trench; preparation of the avionics bays in the aft compartment for flight; cleaning of the aft compartment and installation of its flight doors. The removal of service platforms from the launch platform is scheduled. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 17, 1992, Banke, FLORIDA TODAY, p. 4A, Jan. 17, 1992.]

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STS 45 PROCESSING: ATLANTIS

Atlantis' STS 45 ATLAS payload is scheduled to arrive at Kennedy Space Center's OPF Bay 2 on January 24, two days after the planned launch of Discovery on its STS 42 mission. STS 45 work in progress: leak checks of the main propulsion system; installation of an improved auxiliary power unit in the No. 2 slot; inspections of the windows in the crew cabin; testing of the nose wheel steering system and communications system; functional testing of the orbital maneuvering system, reaction control system and the waste containment system; configuring the payload bay for the ATLAS payload. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 17, 1992.]

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ENDEAVOUR: WORK IN PROGRESS

Processing activities include: installation of the Orbiter's flight tires; preparation to service the ammonia boiler; tests of the flight control aerosurfaces and the main propulsion gaseous oxygen system; sampling and adjusting of the water loops; structural leak checks of the drag chute pod; leak tests of the crew cabin; leak checks of the environmental control life support system; leak and functional tests of the flash evaporator system; closeouts of the midbody; installation of tiles; thermal protection system operations and fit checks of the Orbiter's waste containment system. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 17, 1992.]

January 19:

APOLLO 11 SOCIETY'S TOWER PLANS

The Apollo 11 Society continues to plan and hope for the rescue and preservation of the launch tower from which the Apollo 11 moon landing mission was begun. Today the tower is located in KSC's Industrial Area; it has been cut into sections and has been rusting away since 1984. The Apollo 11 Society wants the tower saved in its entirety and displayed upright and they want it declared a national monument: "The mission of Apollo 11 was to put a human being on the moon, an actual act of stepping onto another heavenly body in the cold reaches of space, an act that will be perceived by future generations as a stepping stone to the universe," according to Society President Bill Bivings. The primary stumbling block to the restoration of the tower is the price tag, estimated to be \$20 million or more. [Fiorini, FLORIDA TODAY, pp. 1A-2A, Jan. 19, 1992; "Agencies' Mission: Save the Tower," FLORIDA TODAY, p. 2A, Jan. 19, 1992; "Launch Towers," FLORIDA TODAY, p. 2A, Jan. 19, 1992.]

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CREW OF STS 42 ARRIVES TODAY

The seven-member crew of Discovery's STS 42 mission is expected to arrive at Kennedy Space Center today about 9 a.m. EST. The crew includes: Commander Ronald Grabe; Pilot Stephen S. Oswald; Mission Specialists David C. Hilmers, William F. Readdy and Norman E. Thagard; Payload Specialists Roberta L. Bondar (Canada) and Ulf Merbold (European Space Agency.) [Halvorson, FLORIDA TODAY, p. 1A, Jan. 19, 1992.]

January 20:

LAUNCH MINUS TWO DAYS

Launch of the Space Shuttle Discovery on its STS 42 mission remains scheduled for the opening of the two-hour and 48 minute window, or at 8:53 a.m. EST Wednesday, January 22. A major task of the countdown today is loading liquid oxygen and liquid hydrogen into the Orbiter's onboard fuel cell storage tanks. Launch Complex 39A is cleared of all non-essential personnel for this operation which begins at 11 a.m. and ends at 4 p.m.

Engineers are troubleshooting a recorder called modular auxiliary data system (MADS) located in the Orbiter's middeck. MADS records information such as temperatures, vibrations, pressures of various systems on the Orbiter such as the main engines, the orbital maneuvering system and reaction control system. Data recorded by MADS is reviewed after the mission. MADS supplements existing Orbiter instrumentation. The exact problem with MADS has not yet been determined. Engineers plan to remove and replace the recorder; changeout and retest operations are expected to be completed by noon on Tuesday. The seven-member flight crew arrived yesterday (January 19) to begin final preparations for the launch. Today, the crew will have a brief medical exam, perform fit checks of their equipment and review flight plans. Commander Ronald Grabe, and Pilot Stephen S. Oswald are scheduled to practice approaches to the SLF in the Shuttle Training Aircraft and in their T-38 jets today. The STS 42 launch countdown began at 1 p.m. yesterday as scheduled; the count entered the first of several built-in holds at 5 a.m. This hold is four hours long. Overnight, firing room 3 console engineers prepared Discovery's three main engines for flight, including power up of the controllers, purges of the engines and functional checks. The rotating service structure is scheduled to be moved away from the launch vehicle at 1 p.m. Tuesday (January 21); loading of a half a million gallons of liquid oxygen and liquid hydrogen propellants into the external tank is scheduled to begin at 12:33 a.m. Wednesday (January 22). Discovery will be carrying the International Microgravity Laboratory into space for a seven-day flight with the landing planned at Edwards Air Force Base, CA. More than 200 scientists from 16 countries are participating in the IML investigations. Tomorrow (January 21), beginning at 9 a.m., technicians will load flight experiments in nine middeck lockers in the Orbiter's middeck. Because of their nature, these experiments require late stowage into the vehicle. Weather forecasts for January 22's launch indicate there will be an 80 percent chance of having acceptable weather at the opening of the window and a 90 percent chance for good weather during the entire launch window. [KSC SHUTTLE STATUS REPORT, "Launch Minus Two Days", 9:30 a.m., Jan. 20, 1992, Leary, THE NEW YORK TIMES, p. A7, Jan. 21, 1992; Banke, FLORIDA TODAY, p. 1A, Jan. 20, 1992.]

January 21:

LAUNCH MINUS ONE DAY

Launch of Discovery's STS 42 mission remains scheduled for the opening of the two-hour and 48 minute window, or at 8:53 a.m. EST Wednesday, January 22. Overnight, engineers replaced a modular auxiliary data system [see story above]. Members of the flight crew were briefed this morning on the status of the vehicle, payload and weather. Red team members - Mission Specialists William F. Readdy, David C. Hilmers (who replaced the late Manley "Sonny" Carter who was killed in a plane accident last year) and Payload Specialist Ulf Merbold - are scheduled to be awakened at 8 p.m. tonight in preparation for the launch. Blue team members - Commander Ronald Grabe, Pilot Stephen S. Oswald, Mission Specialist Norman E. Thagard and Payload Specialist Roberta L. Bondar - are scheduled to be awakened at about 4 a.m. EST tomorrow for the flight. Yesterday, liquid oxygen and liquid hydrogen reactants were successfully loaded into the Orbiter's onboard fuel cell storage tanks. The Orbiter's communications systems have been activated. The countdown for STS 42 began at 1 p.m. Sunday as scheduled. The count entered another built-in hold at 5 a.m. today which extends until 6:33 p.m. tonight. The rotating service structure will be moved away from the launch vehicle at noon today. Loading of half a million gallons of liquid oxygen and liquid hydrogen propellants into the external tank will occur beginning at 12:33 a.m. Wednesday (January 22). This morning, the International Microgravity Laboratory in Discovery's payload bay was powered down in preparation for launch. Shortly after launch, crew members will activate the systems aboard IML. Today, technicians will load dozens of

experiments in nine lockers in the Orbiter's middeck. Because of their nature, these experiments require late stowage into the Orbiter. Forecasts for launch indicate there will be a 90 percent chance of having acceptable weather at the opening of the window and a 95 percent chance for good weather during the entire launch window. The expected temperature at launch time is 54 degrees. [KSC SHUTTLE STATUS REPORT, "Launch Minus One Day," 9:30 a.m., Jan. 21, 1992; Banke, FLORIDA TODAY, p. 10E, Jan. 19, 1992.]

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FISK: MOST INTERNATIONAL MISSION EVER

It is the most international mission that we have ever undertaken," said NASA Space Science Chief Lennard A. Fisk in a Kennedy Space Center press conference televised over closed circuit television from the Press Site near the Vehicle Assembly Building. Shuttle Program Director Leonard S. Nicholson said, "We're really ready to go." Weather is forecast to be 95 percent favorable for launch tomorrow morning. [Banke, FLORIDA TODAY, p. 6A, Jan. 22, 1992.]

January 22:

STS 42 LAUNCHES 1 HOUR LATE

"We've had a flight every month and a half for well over three years," remarked Admiral Richard H. Truly following the successful launch of STS 42. "The achievement is flying this many flights and to do it safely on a regular basis." Discovery's launch was the 20th successful launch after the Challenger 51-L accident January 28, 1986. The STS 42 crew included: Commander Ronald Grabe, Pilot Stephen S. Oswald, Mission Specialists Norman E. Thagard, William F. Readdy and David C. Hilmers and Payload Specialists Roberta L. Bondar (Canada) and Ulf Merbold (Germany). Problems delayed the launch of Discovery on its STS 42 mission for an hour this morning; the Orbiter finally lifted off at 9:52:33.0491 a.m. EST and headed for an orbit 187 miles above the Earth. Late in the countdown three problems were detected: sensors near the launch pad noted an electrical charge in the atmosphere which was outside launch limits; a switch on one of Discovery's fuel cells was found to be faulty but mission managers decided there was no danger to flight safety; the Orbiter's rear engine compartment and payload bay were purged of high levels of gaseous oxygen. Preliminary reports indicate the boosters look very good. Thorough inspections will be conducted at Hangar AF at Cape Canaveral Air Force Station. Both solid rocket boosters are estimated to arrive at Port Canaveral at 9 p.m. tonight. High sea state conditions make the towing operation slower. There are 30 knot winds and 10 foot waves. They will remain overnight in port and the ships will begin the tow to Hangar AF at sunrise tomorrow. They impacted the Atlantic Ocean due east of Jacksonville. Larger than normal crowds were on hand to view the launch; officials estimated the spectators to number between 40,000 and 45,000 persons. Landing is planned on Wednesday, January 29, at Edwards Air Force Base (CA) at approximately 11:05 a.m. EST. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 23, 1992, Leary, THE NEW YORK TIMES, p. A11, Jan. 23, 1992, Halvorson and Banke, FLORIDA TODAY, p. 1A-2A, Jan. 22, 1992.]

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X-15 PILOT JOINS SPACE MIRROR HONOREES

Air Force Major Michael J. Adams, who was promoted to astronaut status posthumously, was killed while flying the X-15 experimental aircraft on November 15, 1967. Adams' name will be added to the Astronauts Memorial Foundation's Space Mirror along with that of Astronaut Manley "Sonny" Carter, who was killed last year in a plane crash. AMF founder and chairman Alan Helman said, "AMF is proud to honor both of these courageous men

by adding their names alongside the 14 other men and women who gave their lives in the exploration of space." The names will be added in mid-February when workers replace several panels that have cracked since the May 9 dedication of the national monument. [Beecken, FLORIDA TODAY, p. 1B, Jan. 23, 1992.]

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BUSY FEBRUARY FOR KSC WORKERS

Kennedy Space Center Shuttle Launch Director Robert B. Sieck said today that next month will be "busy times for those that are still on the ground." The agenda features: the return to KSC of Discovery from its planned Edwards Air Force Base (CA) landing and the return to flight status of the Space Shuttle Columbia which returns from extensive modifications undergone the past few months in Palmdale, CA. On February 16, Atlantis will be rolled from its hangar to the Vehicle Assembly Building for mating with its external tank and solid rocket boosters; rollout is targeted for February 24 followed a month later (March 23) with launch. Endeavour, the newest Space Shuttle, will be rolled from OPF Bay 1 to the VAB in late February; the Orbiter will have its maiden launch in late April or early May. [Halvorson, FLORIDA TODAY, p. 4A, Jan. 23, 1992.]

January 23:

STS 45 PROCESSING: OPF BAY 2

In Orbiter Processing Facility Bay 2, technicians continue processing the Space Shuttle Atlantis. Work in progress includes: leak checks of the main propulsion system; servicing of the auxiliary power units with lube oil; installation of windows in the crew cabin and of heat shields around the main engines; testing of the communications system; functional testing of the orbital maneuvering system and reaction control system; configuring the payload bay for the STS 45 payloads. Scheduled work: ATLAS payload arrival set for January 25 whereupon it will be installed in the cargo bay; the Crew Equipment Interface Test with the STS 45 flight crew on February 1. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 23, 1992.]

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ENDEAVOUR: PROCESSING STATUS

In OPF Bay 1, technicians are working on the following Endeavour activities: installation of the flight tires; preparations for a test of the flight control aerosurfaces; servicing of the potable water system; installation of the waste containment system; stowing of the Ku-band antenna; closure of the payload bay doors; tests of the main propulsion gaseous oxygen system; leak tests of the crew cabin; leak checks of the environmental control life support system; closeouts of the midbody; installation of tiles and thermal protection system operations. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 23, 1992.]

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COLUMBIA IN PALMDALE, CA

The mock orbital maneuvering system pods are scheduled to be installed later this week. The tail cone is scheduled to be installed late this month or early next month. The extended duration Orbiter pallet is being stored in the VAB high bay 2 where it will be checked out for installation in Columbia's payload bay. Columbia is targeted for its return to Florida on February 8. There will be a two-day ferry flight from California to Florida beginning February 7. Columbia will be in OPF Bay 3 for STS 50 processing. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 23, 1992.]

January 24:

BUSH LAUNCHES ISY

President **George Bush** today kicked-off International Space Year (ISY) - a year-long, worldwide celebration of space cooperation and discovery. Participating in the White House even were NASA Administrator **Richard H. Truly**, the crews of four of NASA's most recent Space Shuttle missions, ISY dignitaries, and students and teachers from the Young Astronaut Program. During ISY, 29 space agencies and ministries from around the world, 10 international organizations and the United Nations will celebrate the spirit of discovery and will work together to promote a new era of global cooperation and to increase knowledge of planet Earth. NASA has been designated by Congress as the lead U.S. agency responsible for developing and monitoring ISY events domestically and internationally. Dr. **Lennard A. Fisk**, NASA's Associate Administrator for Space Science and Applications, is the lead representative for the U.S. ISY initiative. In 1985, the late Senator **Spark Matsunaga** (D-Hawaii) proposed a 1992 International Space Year to commemorate the 500th anniversary of Columbus' discovering the New World and the 35th anniversary of the International Geophysical Year that ushered in the space age. Congress adopted ISY in 1986 and the United Nations General Assembly endorsed it in 1989. Today it has developed into a worldwide space activity. The U. S. International Space Year Association (US-ISY) was established with support from NASA to provide information on ISY events. US-ISY publishes a list of activities that can be obtained by writing US-ISY, 600 Maryland Avenue, SW, Suite 600, Washington, D.C., 20024, or by phoning 202/863-1734. **[NASA/KSC NEWS RELEASE NO: 92-12 Jan. 24, 1992.]**

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DISCOVERY: SRBS ARRIVE AT HANGAR AF

The right hand STS 42 solid rocket booster arrived at Hangar AF this morning where it is being hoisted out of the water and into its stand. The Freedom Star and the left hand booster are due at Hangar AF this morning. Workers will wash down the boosters and safe them today and will take the weekend off. A thorough inspection will be conducted on Monday (January 27). The boosters will be disassembled and sent back to Thiokol (Brigham City, UT) for refurbishment. The forward and aft skirts will be refurbished at KSC by USBI. Discovery's landing at Edwards Air Force Base (CA) is scheduled for 11:06 a.m. EST. **[KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 24, 1992.]**

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ATLANTIS: APUS SERVICED

The auxiliary power units of Atlantis have been serviced with lube oil; three windows have been installed in the crew cabin and functional tests of the orbital maneuvering system and reaction control system have also been completed by technicians preparing the Orbiter for its STS 45 mission in OPF Bay 2. Work in progress: leak checks of the main propulsion system; installation of heat shields around the main engines; cleaning of the payload bay; configuring of the payload bay for the STS 45 payloads. Work scheduled: ATLAS payload is scheduled to arrive at the OPF January 25 for installation in the payload bay; the Crew Equipment Interface Test with the STS 45 flight crew onboard is scheduled for February 1. **[KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 24, 1992.]**

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ENDEAVOUR IN OPF BAY 1

In Orbiter Processing Facility Bay 1, Endeavour is being prepared for a test of its flight control aerosurfaces; Endeavour's maiden launch will be the STS 49 mission scheduled for late April or early May of this year. Other processing work in progress: installation of the waste containment system; preparing the hydraulic system for the flight control test;

preparations for the structural leak tests; stowing the Ku-band antenna; closure of the payload bay doors; tests of the main propulsion system; leak tests of the crew cabin; leak checks of the environmental control life support system; closeouts of the midbody of Endeavour; thermal protection system operations; test of the nose wheel steering system. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 24, 1992.]

II

COLUMBIA'S RETURN PREPARATIONS

The mock orbital maneuvering system pods are scheduled to be installed later this week; the tail cone is scheduled to be installed late this month or early next month. The extended duration Orbiter pallet is being stored in the VAB high bay 2 where it will be checked out for installation in Columbia's payload bay. Columbia is targeted to return to Florida on February 8. There will be a two-day ferry flight from California to Florida beginning February 7; Columbia will be in OPF Bay 3 for STS 50 processing. [KSC SHUTTLE STATUS REPORT, 11 a.m., Jan. 24, 1992.]

January 26:

DISCOVERY TO GET MAKEOVER

First, it was Columbia; now, it's Discovery which is scheduled for extensive modifications which are expected to take some 222 days in a processing hangar. Kennedy Space Center Director Robert L. Crippen said, "It will be the same kind of things we did on Columbia." NASA plans to spend a total of \$33 million refurbishing both Discovery and Atlantis. The expense of modifying Columbia in California came to approximately \$24 million. Chris Fahey is in charge of modifying Discovery; "In any kind of vehicle, whether it's a plane or a car or whatever, you have to stop once in awhile and do maintenance." Managers are hoping that it will save time to do Discovery's overhaul at KSC. "There may not be many mission specific things you can do, but whatever you can do, it's to your advantage to do them here," according to Fahey. Among the 41 modifications planned for Discovery are: the installation of a drag chute, upgraded auxiliary power units and an improved nosewheel steering system. [Banke, FLORIDA TODAY, pp. 10E & 9E, Jan. 26, 1992.]

January 27:

EXTRA DAY GIVEN TO DISCOVERY

This morning, Shuttle managers decided to extend Mission STS 42 one extra day. The crew has conserved enough consumables to safely extend the flight which was originally scheduled to land on Wednesday. Landing is now planned on Thursday [January 30] shortly after 11 a.m. EST at Edwards Air Force Base (CA) on orbit 129. A post-flight assessment of the STS 42 solid rocket boosters is planned today at Hangar AF. Last week, workers washed and safed the boosters. The boosters will be disassembled and shipped back to Thiokol (Brigham City, UT) for refurbishment. The forward and aft skirts will be refurbished here by USBI. As the crew of Discovery prepared to extend their stay in space by one day, Mission Specialist Dr. Norman E. Thagard took on extra work to give fellow crewmember Dr. Roberta L. Bondar could relax. He said, "I've been here before. This is Roberta's first trip; give her a chance to look out the window." Thagard is making his fourth Shuttle flight and will have accumulated a record of more than 600 hours in space. [Banke, FLORIDA TODAY, p. 1A, Jan. 27, 1992, Banke, FLORIDA TODAY, p. 1A, Jan. 28, 1992, "Shuttle May Stay Aloft An Extra Day," USA TODAY, p. 3A, Jan. 27, 1992, "NASA Considers Extending Shuttle Mission," THE NEW YORK TIMES, p. A6, Jan. 27, 1992, KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 27, 1992, Banke, FLORIDA TODAY, p. 1A, Jan. 29, 1992, Banke, FLORIDA TODAY, p. 1A, Jan. 30, 1992, "Day Before Landing, Shuttle Crew Eases Up," THE NEW YORK TIMES, p. A7, Jan. 30, 1992.]

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WILLIAM R. SCHINDLER, DEAD AT 64

The father of the Delta Program, William R. Schindler, died today at Loma Linda University Medical Center (Loma Linda, CA). He helped pioneer the Delta Program for NASA. In 1991, Schindler was awarded the Special Achievement Award of the National Space Club "for management of the evolutionary development of the Delta Program." He also received the NSC's Astronautics Engineer Award (1980) and NASA's Distinguished Service Award. [Bailey, FLORIDA TODAY, p. 9E, Feb. 2, 1992.]

I

LAUNCH RULES MAY EASE

This month, NASA began its final phase of "field mill" flight tests to study launch-related weather at its Florida launch site. "Field mills" are instruments that detect the presence of electric charges in the atmosphere. Results from earlier flights demonstrated that present weather rules fully protect space launch vehicles from triggered lightning hazards. However, there is strong evidence that a number of rules are overly conservative and potentially, could delay launches under weather conditions that do not pose any real lightning threats. A NASA Learjet from Langley Research Center (Hampton, VA) has been flown in the vicinity of NASA Kennedy Space Center, FL, and USAF launch facilities at Cape Canaveral, FL, collecting meteorological data and atmospheric electric field strength data. Seasonal data has been taken for two summer seasons and one previous winter season. The flight test series just underway, the last in the series, is planned for 8 weeks.

"In a limited number of cases to date," said William Bihner, NASA Airborne Field Mill Program Manager, "the weather was in violation of launch commit criteria as written, but we did not measure an electrical hazard aloft. It looks very promising that by the conclusion of the program we will be able to recommend changes to present launch commit criteria that will maintain launch safety while reducing launch restrictions." The set of criteria most likely to be relaxed are those that govern launches through or near cumulus clouds, large puffy clouds that appear most often in the spring or summer. The next best candidate for relaxation are those associated with layered clouds, seen most often in the winter. The layered cloud phenomena has the greatest impact on Space Shuttle and other rocket launches from the Kennedy Space Center and the USAF Eastern Test Range.

There are six natural and triggered lightning constraints that can delay a launch. Flight data was collected for each. The first rule prohibits a launch within 10 nautical miles of any type of lightning 30 minutes prior to launch. The second prohibits a launch through or near cumulus clouds, depending upon the combination of distance and temperature at the cloud top. The remaining rules deal with the intensity of the electric field as measured at the surface, the presence or absence of vertically continuous layers of clouds and the presence of disturbed weather (moderate or greater precipitation) or debris clouds associated with a thunderstorm. Safely opening the launch window even a little in the thunderstorm-prevalent Central Florida area could result in a significant reduction of lightning-related launch delays. Electrically charged clouds, believed to be lightning conductive, pass over the Cape Canaveral area more than 100 days each year, especially from May to September. A lightning strike to a vehicle can be triggered when the vehicle passes near a thunderstorm or even through an electric field left from a decaying thunderstorm. Components in the rocket or its payload can be damaged by the strike. A change in lightning rules will not occur immediately, Bihner said. Enough data must be collected to be considered statistically significant and the conclusions must

be scientifically validated, then Air Force and NASA officials will have to approve changes, he said. The process will be slow and deliberate because safety is involved, he added.

Funding for the joint NASA-Air Force Airborne Field Mill Program is provided by the NASA Headquarters Office of Space Flight, Washington, D.C., and the USAF Space Systems Division, Los Angeles. Participants in the field mill program are drawn from the USAF 45th Space Wing and three NASA centers. The Marshall Space Flight Center (Huntsville, AL) designed and fabricated the onboard electric field sensors and is responsible for data processing, archiving and analysis. Langley is providing the aircraft and all flight support. Kennedy is providing real-time weather data, aircraft guidance and real-time ground station support during data gathering flights. The aircraft is controlled from and data collected at the 45th Space Wing's Range Operations Control Center. [NASA/KSC NEWS RELEASE NO: 92- Jan. 27, 1992.]

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ATLANTIS: ATLAS PAYLOAD INSTALLED

The ATLAS payload has been installed in Atlantis in OPF Bay 2; pressure checks of the main landing gear tires have also been completed in preparation for the Orbiter's upcoming STS 45 mission. Work in progress: preparations for payload testing this week to verify connections between the Orbiter and ATLAS; tests of the main propulsion system and main engines; servicing of the ammonia system and the potable water system; installation of the heat shields around the main engines and the windows in the crew cabin; configuring the payload bay for the STS 45 payloads. Work scheduled: installation of the Shuttle Solar Backscatter Ultraviolet (SSBUV) payload into the payload bay tomorrow (January 28); ATLAS payload interface verification test this week; Crew Equipment Interface Test with the STS 45 flight crew on February 1. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 27, 1992.]

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ENDEAVOUR: FCFR TEST

In Orbiter Processing Facility Bay 1, technicians have completed Endeavour's Flight Control Frequency Response Test and scheduled the installation of the Orbiter's drag chute. Work in progress: installation of the waste containment system; structural leak tests; tests of the main propulsion system; leak tests of the crew cabin; leak checks of the environmental control life support system; closeouts of the midbody; thermal protection system operations; test of the nose wheel steering system. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 27, 1992.]

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COLUMBIA: KSC RETURN PREPARATIONS

The external tank for Columbia's STS 50 mission is scheduled to arrive in the KSC turn basin today. The tank will be transferred to its cell in the VAB. The mock orbital maneuvering system pods are scheduled to be installed for the ferry flight. The tail cone is scheduled to be installed later this week. Columbia is scheduled to return to Florida on February 8. Columbia will be processed for STS 50 in OPF Bay 3. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 27, 1992.]

January 28:

CHALLENGER ASTRONAUTS REMEMBERED

At the annual Astronaut Memorial Ceremony (Titusville, FL), former astronaut and Grumman Technical Services President Fred Haise said that pushing back the frontiers

of space carries risk and the possibility of heartbreak. "That's why we're here today," he said. "But if the Challenger crew were with us, they would say, 'Press on, the price is worth it. Humans have been placed on this spacecraft Earth with the ability, uniquely, to leave it. I believe the ultimate destiny of the human race is to explore and populate other planets.'" Haise was lunar module pilot on the ill-fated Apollo 13 mission in 1969. "We did not want our failure to slow down or halt the quest, and I know the Challenger crew would feel the same," he said. At the close of the ceremony, the approximately 100 people in attendance placed flowers at the Astronaut Memorial which commemorates both the Challenger crew and those who died in the Apollo 204 fire January 27, 1967. [Fiorini, FLORIDA TODAY, Jan. 29, 1992.]

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DISCOVERY: FLIGHT DAY 7

Discovery's landing and the end of its STS 42 mission is planned for Thursday (January 30) at 11:09 a.m. EST at Edwards Air Force Base (CA) on orbit 129. The STS 42 boosters are being prepared for disassembly and shipment back to Thiokol (Brigham City, UT) for refurbishment. The forward and aft skirts will be refurbished here by USBI. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 28, 1992, KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 29, 1992.]

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ATLANTIS: AMMONIA SYSTEM SERVICED

Technicians in Orbiter Processing Facility Bay 2 have finished servicing the Orbiter's ammonia system. Work in progress: installing the Shuttle Solar Backscatter Ultraviolet (SSBUV) payload into the payload bay; preparations for payload testing this week to verify connections between the Orbiter and ATLAS and the SSBUV; tests of the main propulsion system and main engines; preparations to service the potable water system; installing heat shields around the main engines; configuring the payload bay for the STS 45 payloads. Work scheduled: ATLAS payload interface verification test this week; Crew Equipment Interface Test with the STS 45 flight crew on February 1. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 28, 1992.]

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ENDEAVOUR: PROCESSING ACTIVITIES

Workers have installed the waste containment system in the Space Shuttle Endeavour. Other work in progress includes: structural leak tests of all areas of the Orbiter; tests of the main propulsion system; leak tests of the crew cabin; leak checks of the environmental control life support system; closeouts of the midbody; thermal protection system operations; test of the nose wheel steering system; installation of the drag chute. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 28, 1992.]

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COLUMBIA: FERRY FLIGHT PREPARATIONS

The external tank for STS 50 arrived at Kennedy Space Center by barge yesterday (January 27) and was transferred to the checkout and storage cell in the Vehicle Assembly Building. The mock orbital maneuvering system pods are being installed this week in preparation for the ferry flight; the tail cone is scheduled to be installed later this week. Columbia will return to KSC on February 8 and begin processing activities for STS 50 in OPF Bay 3. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 28, 1992.]

January 29:

SSBUV INSTALLED ON ATLANTIS

The Shuttle Solar Backscatter Ultraviolet (SSBUV) payload has been installed into the payload bay of Atlantis in preparation for its upcoming STS 45 flight. Work in progress: installing sleep stations in the middeck; preparations for payload testing this week to verify connections between the Orbiter and ATLAS and the SSBUV; tests of the main propulsion system and main engines; preparations to service the potable water system; installing heat shields around the main engines; configuring the payload bay for the STS 45 payloads. Work scheduled: ATLAS payload interface verification test tonight; Crew Equipment Interface Test with the STS 45 flight crew on February 1; frequency response test of the aerosurfaces next week; functional test of the landing gear next week. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 29, 1992.]

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ENDEAVOUR: RADAR ALTIMETER TESTS

Tests of Endeavour's radar altimeter are underway in OPF Bay 1. Other work in progress includes: fit checks and installation of the waste containment system; structural leak tests of all areas of the Orbiter; tests of the main propulsion system; leak tests of the crew cabin; leak checks of the environmental control life support system; closeouts of the midbody; thermal protection system operations. [KSC SHUTTLE STATUS REPORT, 10 a.m., Jan. 29, 1992.]

January 30:

LC 39B READY FOR ENDEAVOUR

Managers at Kennedy Space Center have decided that Launch Complex 39B will be ready to support the maiden voyage of Endeavour on mission STS 49 later this year. Pad 39B, one of two KSC Shuttle launch facilities, has undergone an estimated \$3.5 million in modifications and repairs to the structure and associated payload handling facilities. The extensive work has been conducted over the past half year and will provide KSC again with two pads available for Shuttle launches. "We needed six months because of two primary modifications that were time drivers," said F. C. "Sonny" Jones, NASA Project Manager. One driver was the removal of the Payload Ground Handling Mechanism platform and replacement with the Clean Access Platform (CAP), along with the installation of a manrated CAP hoist system. The second modification was a complete rework of the Environmental Control System. This included the control system, control room and installation of a new reinforced cooling tower. A total of 51 modifications to Pad B were made. [NASA/KSC NEWS RELEASE NO: 13-92, Jan. 30, 1992.]

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ATLAS 2 LAUNCH DELAYED WEEK

A fuel leak has delayed the launch of an Air Force Atlas 2 rocket with its military communications payload for at least a week. The launch was to have occurred January 31 at 6:30 p.m. The delay will move up the launch of an Air Force Delta 2 at Cape Canaveral Air Force Station. The Delta is expected to launch with a \$65 military navigation satellite on February 3 between 6:46 p.m. and 7:18 p.m. ["Booster Problem Stalls Atlas Flight," FLORIDA TODAY, p. 2A, Jan. 28, 1992, "Atlas 2 Liftoff Put Off 1 Week," FLORIDA TODAY, p. 4A, Jan. 30, 1992.]

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DISCOVERY LANDS AT EDWARDS

The Space Shuttle Discovery landed this morning at 11:07 a.m. at Edwards Air Force Base, CA; STS 42 concluded on orbit 129. Main gear touchdown was on runway 22 at mission elapsed time of 8 days, 1 hour, 14 minutes, and 45 seconds. Discovery's stay in California will be extended about one week while the Orbiter Columbia is ferried from Palmdale, CA, to Florida. Discovery's ferry flight to Florida is scheduled to begin February 11 and conclude at Kennedy Space Center the following day. KSC's Shuttle recovery team is at the Dryden Flight Research Facility to prepare the Orbiter for the return to Florida; later today, Discovery will be towed to the Mate Demate Device where technicians can gain access to various areas of the vehicle. Hydrolasing activities are underway at Hangar AF to prepare the STS 42 boosters for disassembly and shipment back to Thiokol (Brigham City, UT) where they will be refurbished. The forward and aft skirts will be refurbished at the space center by USBI. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., Jan. 30, 1992, Banke, FLORIDA TODAY, p. 1A, Jan. 31, 1992.]

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ORBITER/PAYLOAD CONNECTIONS TESTED

Technicians in Orbiter Processing Bay 2 are currently testing the connections between Atlantis and ATLAS and the Orbiter and the SSBUV. Also underway are leak and functional tests of the auxiliary power units; functional testing of the external tank doors; installation of sleep station pallets in the middeck; tests of the main propulsion system and main engines; servicing of the potable water system; installation of heat shields around the main engines. Scheduled work: Crew Equipment Interface Test with the STS 45 flight crew in attendance on February 1; a frequency response test of the aerosurfaces next week and a functional test of the landing gear next week. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., Jan. 30, 1992.]

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ENDEAVOUR: LEAK CHECKS COMPLETED

Leak checks of Endeavour's main propulsion system have been completed during processing of the Orbiter for its maiden voyage, STS 49. Work in progress: tests of the radar altimeter; fit checks of the middeck lockers; installation of panels in the middeck; structural leak tests of all areas of the Orbiter; tests of the main propulsion system; leak checks of the environmental control life support system; closeouts of the midbody; thermal protection system operations. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., Jan. 30, 1992.]

January 31:

DISCOVERY: TILE INSPECTIONS

Middeck experiments have been removed from Discovery and inspections of the Orbiter's thermal protection system are underway now that the vehicle has been towed to the Mate Demate Device at the Dryden Flight Research Facility in California. Drying operations on Discovery's three main engines are underway. A nominal two-day ferry flight from California to Florida will bring Discovery into KSC on February 12; several refueling stops are required due to the weight of the International Microgravity Laboratory payload which remains in the Orbiter's cargo bay. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., Jan. 31, 1992.]

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ATLANTIS: APU TESTS FINISHED

Leak and functional tests of Atlantis' auxiliary power units have been completed by technicians in OPF Bay 2 at Kennedy Space Center. Work in progress: functional tests

of the external tank doors; installation of sleep station pallets; interface connection verifications; main engine and main propulsion system tests and servicing of the potable water system. Scheduled work includes: CEIT, frequency response test of aerosurfaces and functional tests of the landing gear. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., Jan. 31, 1992.]

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OPF BAY 1: ENDEAVOUR PROCESSING

In OPF Bay 1, technicians are conducting electrical redundancy tests of Endeavour's orbital maneuvering system. Other work in progress includes: connections of fluid lines to auxiliary power unit no. 1; tests of the radar altimeter; fit checks of the middeck lockers; installation of panels in the middeck; structural leak tests of all areas of the Orbiter; tests of the main propulsion system; leak checks of the environmental control life support system; closeouts of the midbody; thermal protection system operations. Leak tests of the crew module are also scheduled. Meanwhile, work on Columbia is nearing completion to ready the vehicle for the ferry flight from California to KSC on February 8. Columbia is scheduled to be processed for the STS 50 mission in OPF Bay 3. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., Jan. 31, 1992.]

FEBRUARY

February 2:

DELTA LAUNCH SET FOR 4TH

The Air Force will launch its first Delta 2 rocket in seven months on February 4. The launch window extends from 6:46 p.m. until 7:18 p.m. Anne McCauley, spokeswoman for Delta's manufacturer McDonnell Douglas Space Systems Co. said, "Our launch team is anxious and ready." The Delta will carry the 12th Navstar GPS satellite; these satellites aid navigation U. S. ships, submarines, jets, bombers and tankers and guide troop maneuvers throughout the world. [Halvorson, FLORIDA TODAY, p. 7A, Feb. 2, 1992; Halvorson, FLORIDA TODAY, p. 10E, Feb. 2, 1992.]

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KUMERFIELD/KRAFT WIN SILVER SNOOPY

Air Force Majors Thomas Kraft and Jack Kumerfield have been awarded the Silver Snoopy by Astronaut Frederick Gregory. ["Outstanding Service," FLORIDA TODAY, p. 9E, Feb. 2, 1992.]

February 3:

COLUMBIA'S MODIFICATIONS

The Space Shuttle Columbia is scheduled to return to the Orbiter fleet at Kennedy Space Center on February 8, completing a six-month modification period at Shuttle manufacturer, Rockwell International (Palmdale, CA). "We're pleased with the work Rockwell has performed to upgrade Columbia. A lot of cooperation between all parties involved was necessary to bring us to this point and we are upbeat," said Bascom Murrah, Columbia's Processing Manager. The senior Space Shuttle will leave Palmdale (CA) aboard the Shuttle Carrier Aircraft (SCA) on February 7 and land the following day of the Shuttle Landing Facility at Kennedy Space Center. One of the more significant changes made to Columbia will allow the Orbiter to fly longer missions, up to 16 days. The experience gained from these longer flights will be used to planned crew activities aboard Space Station Freedom. Changes made to equip the Orbiter for extended flight include increasing the vehicle's power and waste collection capacity, adding a regenerating system for removing carbon dioxide from the crew cabin atmosphere, installing two additional nitrogen tanks for the crew cabin atmosphere, and adding extra middeck lockers.

A pallet of extra tank sets to hold liquid hydrogen and liquid oxygen reactants is required to support the extended Shuttle missions; these four tank sets, in addition to the four already onboard Columbia, will supply the Orbiter's fuel cells which produce electrical power and drinking water. Called the Extended Duration Orbiter (EDO) pallet, this pallet was built to hold the four oxidizer and four fuel tanks required for longer space missions. It arrived at Kennedy Space Center the second week of January (1992) and is being processed and tested in a designated area of the Vehicle Assembly Building. It will be mounted near the rear bulkhead of the Orbiter's payload bay and connected to Columbia's systems. Approximately fifty (50) other modifications were made to Columbia, including improved nose wheel steering capability, carbon brakes, improved auxiliary power units and installation of five new general purpose computers. Developmental flight instrumentation that is no longer required was removed. In addition, Columbia was outfitted with a drag chute pod and its thermal protection system was enhanced. As part of periodic maintenance, Columbia underwent the most extensive structural inspections performed on an Orbiter to date. Visual and borescope inspections were performed to identify any fatigue, stress or cracks in the Orbiter's structure. This trip marked the

second time Columbia was shipped to the manufacturing plant for modifications since it inaugurated NASA's Space Shuttle Program eleven years ago with the launch of STS 1 on April 12, 1981.

Hundreds of modifications were made to Columbia during an 18-month period in 1984-85, primarily to add improved components, to structurally beef up the Orbiter and to remove some of the development flight instrumentation required to fully understand the operation of the new Shuttle. In 1989, an additional 250 modifications were made to Columbia as part of the return-to-flight improvements. Following its last flight, STS 40, Columbia was prepared for shipment to California; the Orbiter was ferried to the Rockwell plant in Palmdale on August 9, 1991, where it has been ever since. Preparations for Columbia's next flight - STS 50 in June - will take place in Orbiter Processing Facility Bay 3. The 15-foot-wide EDO pallet will be installed and tested in the Orbiter's payload bay. Major components of the Orbiter will be installed in the OPF, including both orbital maneuvering system pods, the forward reaction control system and the three main engines. The United States Microgravity Laboratory, primary payload for Mission STS 50, will be installed in Columbia's payload bay and tested in the OPF. Launch of STS 50 will be from Launch Complex 39A. [NASA/KSC NEWS RELEASE NO. 15-92, Feb. 3, 1992.]

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FUEL LEAK DELAYS DELTA LAUNCH

"There's no doubt in my mind that it will be at least a week and probably more. We're putting together a plan, and it will be later this week before we're ready to say when we can fly," said the commander of the 1st Space Launch Squadron Lt. Col. Randy Moyer about the delay in launching the Delta 2 rocket at Cape Canaveral Air Force Station. The postponement was due to a toxic fuel leak in the second stage of the Delta 2. [Banke, FLORIDA TODAY, Feb. 4, 1992.]

I

DISCOVERY AT DRYDEN

Work is progressing well at Dryden Flight Research Facility (CA) to prepare the Space Shuttle Discovery for its return trip to Florida. Residual hypergolic propellant was offloaded this weekend. Today, the tail cone is scheduled to be installed and all areas of the vehicle will be buttoned up. Booster disassembly operations are continuing at Hangar AF on the Cape Canaveral Air Force Station. The segments will be sent to their Thiokol manufacturing plant (Brigham City, UT) where they will be refurbished. The aft skirts are being removed today. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., Feb. 3, 1992.]

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ATLANTIS: CEIT COMPLETED

In OPF Bay 2, STS 45 crew members have participated in a successful Crew Equipment Interface Test (CEIT); functional tests of the external tank doors and the close out of wings and flipper doors for the Orbiter's transfer to the VAB have also been completed. Work in progress: interface verification tests between the ATLAS and the SSBV payloads; functional test of the radiator latch; installing sleep station pallets in the middeck; tests of the main propulsion system and main engines; servicing of the potable water system; removal of APU No. 1; closing out of the aft compartment. Scheduled work: frequency response test of the aerosurfaces later this week; functional test of the landing gear next week; transferring the Orbiter to the VAB, i.e., rollover, next week. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., Feb. 3, 1992.]

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ENDEAVOUR: CREW MODULE LEAK TESTED

In OPF Bay 1, the crew module has been successfully tested for leaks and APU No. 1 has been installed in Endeavour. The radar altimeter has also been tested. Work in progress: installation of window no. 6; electrical redundancy tests of the orbital maneuvering system; fit checks of the middeck lockers; installation of panels in the middeck; structural leak tests of all areas of the Orbiter; tests of the main propulsion system; leak checks of the environmental control life support system; closeouts of the midbody; thermal protection system operations. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., Feb. 3, 1992.]

February 4:

ATLAS-1/SSBUV: INTERFACE TESTS

Interface verification tests between the ATLAS and SSBUV payloads aboard Atlantis are being conducted in OPF Bay 2. Other work in progress includes: preparations for the flight control test of the aerosurfaces; servicing of the potable water system; closing out of the aft compartment. Work scheduled: frequency response test of the aerosurfaces later this week; functional test of the landing gear next week; transferring the Orbiter to the Vehicle Assembly Building next week. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., Feb. 4, 1992.]

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ENDEAVOUR: TEXT/GRAPHICS SYSTEM INSTALLED

Workers have completed installing Endeavour's text and graphics system aboard the Orbiter in OPF Bay 1. Work in progress includes: installation of window no. 6; configuring the aft flight deck for the STS 49 mission; structural leak tests of all areas of the Orbiter; tests of the main propulsion system; leak checks of the environmental control life support system; installation of the waste containment system; closeouts of the midbody; thermal protection system operations. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., Feb. 4, 1992.]

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LIFE SCIENCES RESEARCH DOOMED AT KSC

The Director of Medical Operations at Kennedy Space Center, Dr. Paul Buchanan, said today that life sciences research at KSC will be shut down by October 1. Buchanan said as many as 33 jobs and a source of additional income for dozens of other KSC employees will be cut. He said only projects directly related to Shuttle operations would continue. "Everything else goes," he said. [Banke, FLORIDA TODAY, Feb. 5, 1992.]

February 5:

EMPLOYMENT: 1000 CUTS BY 1996

NASA officials said today that by 1996 as many as 1,000 Shuttle processing jobs may be cut at Kennedy Space Center; the cuts would save \$550 million. Of the thousand, about 400 would be cut by October 1, according of Director of Shuttle Operations and Management Jay Honeycutt. Of the remaining 600 potential cuts, current plans project the elimination of about 150 slots per year for each of the following four years. Nationwide, NASA plans to cut Shuttle work forces by 5,000 persons during the next five years. Local cuts will be made in the work forces of Lockheed Space Operations Co. and its subcontractors. Lockheed spokesman J. B. Klump said that attrition may account for some of the reduction; the 1,000 jobs to be eliminated are in addition to the 400 cut in 1991. KSC Launch Director Robert B. Sieck said, "We won't sacrifice safety. If we're not able to do it, the impact will be schedule only." The cuts in Shuttle employment may be

offset in part by the expected 650 new hires at KSC to work on the Space Station Program; 75 persons will be hired in 1992. [Banke, FLORIDA TODAY, p. 1A, Feb. 6, 1992, Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Feb. 5, 1992.]

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ATLANTIS: LANDING GEAR TESTED

A functional test of Atlantis' main landing gear has been completed in OPF Bay 2. Work in progress: leak tests of the main engines; rerouting a cable for the GRILLE spectrometer, one of the ATLAS experiments; preparations for the flight control test of the aerosurfaces and to service the potable water system; closing out the Orbiter's midbody and aft compartment. Work scheduled: frequency response test of the aerosurfaces later this week; rolling the Orbiter over to the VAB next week. [KSC SHUTTLE STATUS REPORT, 11:00 a.m., Feb. 5, 1992.]

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ENDEAVOUR: WASTE SYSTEM INSTALLED

The waste containment system has been mechanically installed aboard Endeavour during processing of the fleet's newest Orbiter in OPF Bay 1. Work in progress: hooking up the waste containment system; leak and functional tests of the auxiliary power units; configuring the aft flight deck for the STS 49 mission; tests of the main propulsion system and of the environmental control life support system; closeouts of the midbody and wings and thermal protection system operations. [KSC SHUTTLE STATUS REPORT, 11:00 a.m., Feb. 5, 1992.]

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CARTER/ADAMS ADDED TO MEMORIAL

While the new Astronauts Memorial is closed three weeks for repairs, two new panels will be added to the monument to recognize the late **Manley "Sonny" Carter** who died last year in a commuter airplane crash and Air Force Pilot **Michael J. Adams**, who died in a November 1967 X-15 crash. National Transportation Safety Inspectors cited faulty propeller parts in the accident which took Carter's life. ["Memorial Closed," FLORIDA TODAY, Feb. 5, 1992, "Faulty Propeller Parts Cited in Astronaut's Plane Crash," FLORIDA TODAY, p. 2A, Feb. 4, 1992.]

February 6:

WEATHER DELAYS ATLAS-2 LAUNCH

Windy weather has forced the postponement until February 8 of the launch of an Atlas-2 rocket from Cape Canaveral Air Force Station. The launch will mark the first mission of the Atlas-2 for the Air Force, according to spokeswoman **Terri Bracher**. The rocket will carry the first military satellite in the Defense Satellite Communication System network; it will replace an aging satellite already in orbit. [Halvorson, FLORIDA TODAY, p. 1A, Feb. 7, 1992, Date, THE ORLANDO SENTINEL, Feb. 6, 1992.]

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WEATHER STALLS COLUMBIA RETURN

The Space Shuttle Columbia's planned return to Kennedy Space Center may be delayed by inclement weather in California, according to KSC spokeswoman **Lisa Malone**. Rain has the potential of harming the Orbiter's delicate thermal protection system. Columbia has been bolted to its 747 Shuttle Carrier Aircraft for the ferry flight to Florida. ["Rain Might Douse Shuttle's Return Plan," FLORIDA TODAY, p. 8A, Feb. 7, 1992.]

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ATLANTIS: ROLLOVER SCHEDULED

Atlantis will be rolled over from OPF Bay 2 to the Vehicle Assembly Building next week for mating with its STS 45 external tank and solid rocket boosters. Work in progress: test of a replaced cable for the GRILLE spectrometer - an ATLAS experiment; replacement of the rudder speed brake thermal clip; preparations for the flight control test of the aerosurfaces; closing out the Orbiter's midbody and aft compartment. [FLORIDA TODAY, p. 8A, Feb. 7, 1992.]

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ENDEAVOUR: TESTS UNDERWAY/OPF BAY 1

Work in progress upon Endeavour includes: a functional test of the external tank doors; installation of the drag chute; hooking up the waste containment system; leak and functional tests of the auxiliary power units; configuring the aft flight deck for the STS 49 mission; tests of the main propulsion system and of the environmental control life support system. [FLORIDA TODAY, p. 8A, Feb. 7, 1992.]

February 7:

ATLANTIS: CABLE REPLACEMENT

Workers in Orbiter Processing Facility Bay 2 have successfully retested a replaced cable for the GRILLE spectrometer, one of the ATLAS experiments which are Atlantis' prime STS 45 cargo. The Orbiter's rudder speed brake thermal clip has also been replaced. Work in progress: cleaning and inspecting the cargo bay; stowing the Ku-band antenna for flight; preparations for the flight control test of the aerosurfaces; closing out the Orbiter's midbody and aft compartment. Work scheduled: closing the payload bay doors for flight tomorrow night (February 8); functional test of the galley Sunday night; flight control test of the aerosurfaces Sunday; transferring the Orbiter to the Vehicle Assembly Building on Wednesday (February 12) for mating with the external tank and solid rocket boosters; rollout to Launch Complex 39A targeted for February 19. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 7, 1992.]

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ENDEAVOUR: ET DOORS TESTED

Workers in OPF Bay 1 have tested Endeavour's external tank doors. Work in progress includes: installation of the drag chute; leak and functional tests of the auxiliary power units; configuring the aft flight deck for the STS 49 mission; tests of the main propulsion system and of the environmental control life support system; structural leak tests. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 7, 1992.]

February 8:

SILVER SNOOPY FOR AKE

Jeffrey Ake, an employee of Boeing Aerospace Operations Inc., has been awarded a "Silver Snoopy" by NASA astronaut James H. Newman. Boeing General Manager Dean Helling said, "Jeff [Ake] played a key role in the hydrogen leak detection investigation." Helling added, "It takes a large team of people to put America in space. Jeff is a symbol of someone who made the extra effort on behalf of the space program." ["Boeing Employee Wins 'Silver Snoopy'," FLORIDA TODAY, p. 9E, Feb. 9, 1992.]

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ATLAS 2 LAUNCH SCRUBBED, AGAIN

A problem with the Atlas-2's guidance system and a stuck valve caused the second attempt to launch the rocket to be scrubbed; current plans call for a Sunday (February

9) launch during a window which extends from 6:31 to 7:43 p.m. Air Force Captain Ken Warren said, "We think we've got some resolution of the problem. We'll have meetings this morning [February 9] looking at the situation, and that's when we'll decide if it's ready to go." The first launch attempt was scrubbed due to high winds at Launch Complex 36A at Cape Canaveral Air Force Station. [Halvorson, FLORIDA TODAY, p. 1A, Feb. 9, 1992.]

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WEATHER DELAYS COLUMBIA RETURN

Bad weather in the southwestern United States caused the cancellation of Columbia's first leg of its ferry flight home to Kennedy Space Center. The takeoff from Rockwell International's Palmdale, CA, plant is scheduled for February 9 at 10 a.m. The Orbiter and its Shuttle Carrier Aircraft is expected to arrive at KSC's Shuttle Landing Facility at about mid-day February 10. Columbia's next mission - STS 50 - will be the first long-duration flight and it is scheduled to begin on June 3. [Halvorson, FLORIDA TODAY, p. 2A, Feb. 9, 1992.]

February 9:

COLUMBIA RETURNS TO KSC

Columbia returned home to Kennedy Space Center at 6:08 p.m. after a one-day, cross-country ferry flight. "It's great, said Grant Cates, Columbia's Vehicle Manager at KSC. "We're real pleased." Among the modifications made to the oldest Orbiter: a drag parachute added to make landings safer and increase chances of landing at KSC; a backup nosewheel steering system; equipping the Orbiter to stay in orbit up to 28 days, four times the average length of Shuttle missions so far. [Banke, FLORIDA TODAY, p. 1A, Feb. 10, 1992; Halvorson, FLORIDA TODAY, p. 1A, Feb. 9, 1992.]

February 10:

ATLAS: THIRD TRY THE CHARM

On its third attempt, the Air Force successfully launched its 15-story Atlas 2 rocket at 7:41 p.m. tonight. The launch had originally been set for 6:30 p.m., but a system malfunction delayed the liftoff. "Right now I'm the happiest colonel in the United States Air Force," said Col. Steve Purdy, Mission Director and Director of the DSCS Program. "We got off a superb launch." Tonight's was the first launch of an Atlas 2 rocket; the first launch of a new series of military communications systems and the first launch of an Atlas from LC 36A since May 19, 1983, when an Atlas-Centaur carrying an Intelsat-5 communications satellite was launched. [Banke, FLORIDA TODAY, p. 3A, Feb. 10, 1992, Halvorson, FLORIDA TODAY, p. 2A, Feb. 11, 1992; Date, THE ORLANDO SENTINEL, Feb. 11, 1992.]

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COLUMBIA PROCESSING FOR STS 50 UNDERWAY

Columbia, just returned from California, was towed today into OPF Bay 3 to be processed for its June STS 50 mission involving the Spacelab module. The Shuttle Carrier Aircraft which bore Columbia to KSC has returned to California for the ferry flight of Discovery which landed at Edwards Air Force Base on January 30. NASA has only one set of specially-made doors which cover portions of an Orbiter's underside and allow the vehicle to be bolted to the transport plane. For these reasons, NASA can conduct only one ferry flight at a time. [Banke, FLORIDA TODAY, p. 2A, Feb. 11, 1992.]

February 11:

ATLANTIS: GALLEY TESTS

In OPF Bay 2, technicians processing Atlantis for STS 45 have tested the vehicle's galley, completed strongback removal; closed the Orbiter's payload bay doors and finished

thermal protection system water proofing. Work in progress: preparations for power down later today; aft closeouts; structural leak checks and positive pressure checks. Work scheduled: weight and center of gravity evaluations; positioning of Orbiter transporter for mating; rolling Atlantis over to the Vehicle Assembly Building on February 13 at 8:00 a.m. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 11, 1992.]

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ENDEAVOUR: STRAY VOLTAGE CHECKS

In OPF Bay 1, technicians have completed stray voltage checks on Endeavour in preparation for its STS 49 mission in April. Workers have also installed nose landing gear tires and completed flipper door closeouts. They are conducting water system checks and external tank door functional tests. Installation of the Orbiter's drag chute is underway, too. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 11, 1992.]

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COLUMBIA: STS 50 PROCESSING UNDERWAY

Having been rolled from the Shuttle Landing Facility to OPF Bay 3, the Space Shuttle Columbia is now undergoing processing for its June STS 50 mission in which it will take the United States Microgravity Laboratory into space. The Orbiter has been positioned, jacked and leveled and readied for weight and center of gravity evaluations. Work in progress: removal of doors to gain access to aft and forward compartments; removal of ferry flight tail cone. Work scheduled: power up operations and opening payload bay doors, set for February 14. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 11, 1992.]

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DISCOVERY: DELAYED AT DRYDEN

Discovery could not be mated with the 747 Shuttle Carrier Aircraft as scheduled yesterday due to the intense rain in the southern California region. Mating operations will resume when the rain subsides sufficiently to allow engineers to attach the aft compartment ferry flight doors. The earliest possible departure from Dryden is Wednesday morning with a tentative arrival at Kennedy Space Center set for February 13. Another 24 hour weather delay is possible, however, as rains are forecast to continue throughout today. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 11, 1992.]

February 12:

TRULY RESIGNS

Richard H. Truly resigned today as NASA Administrator. "Frankly it wasn't what I had planned. It's a situation where the president decided...to make a change," Truly said. The Administrator will stay on the job until April 1. John Logsdon, Head of Space Policy Studies at George Washington University said, "This clears the deck for a NASA management committed to the kind of space program that the White House wants to put in place. Truly was fighting a kind of rear guard action for the kind of program he thought the country should have." Former NASA Administrator Thomas O. Paine said that he was "taken completely by surprise. I had rather thought that we on the Augustine commission had served as a bridge between the two sides [White House and NASA]," he said, and "as a result had cooled some of the friction." [Holton, THE ORLANDO SENTINEL, pp. A-1 & A-10, Feb. 13, 1992; Hoversten, USA TODAY, p. 3A, Feb. 13, 1992; Halvorson and Banke, FLORIDA TODAY, p. 1A, Feb. 13, 1992; Eisler and Lunner, FLORIDA TODAY, pp. 1A-2A, Feb. 13, 1992; Sawyer, THE WASHINGTON POST, pp. A1-A44, Feb. 13, 1992; Eisler and Banke, FLORIDA TODAY, p. 4A, Feb. 14, 1992; Halvorson, FLORIDA TODAY, p. 1A, Feb. 15, 1992; Leary, THE NEW YORK TIMES, p. 7, Feb. 15, 1992; Holton, THE ORLANDO SENTINEL, pp. A-1 & A-5, Feb. 20, 1992.]

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TRULY LETTER OF RESIGNATION

February 10, 1992

Dear Mr. President:

It is with the deepest regret that I submit this letter of resignation as the Administrator of NASA. As we discussed when we met today, and because NASA is without a Deputy, I will remain until April 1.

This action will conclude almost 37 years of continuous military and government service for me. I have been unbelievably privileged to have had so many challenging assignments in aviation, space flight, military command and public administration over these years. In our nation's space business, I have enjoyed jobs in every corner of it; civilian and military, highly classified and open, flight and management.

In the last six years since I arrived to join the NASA leadership just after the Challenger tragedy, I have watched the talented men and women of this elite agency turn heartbreak and disarray into the impressive achievements and superb organization of today. With 20 safe and successful Shuttle flights in the past 40 months, scientific discoveries pouring in, Space Station Freedom on track, and our wind tunnels testing the airframes and spacecraft of tomorrow, they deserve to be very, very proud. With your support, their opportunities to inspire America's people and drive our country's competitiveness are boundless. Their achievements result from working daily in a fishbowl world of difficult and exacting tasks, tough judgments and carefully balanced risks; not an endeavor which some would have you think has quick, brilliant and easy solutions.

I think that the job of leading these people is the best one in Washington, and I am proud to have had that privilege. Cody and I particularly want to thank you and Barbara for the personal times you have shared with us over the years.

Sincerely,

Richard H. Truly
Administrator
Vice Admiral, U.S. Navy (Ret.)

[Letter from Richard H. Truly to President George Bush, Feb. 10, 1992; SEE ALSO: Letter from President Bush to NASA Administrator Truly, Feb. 12, 1992; "Bush Puts NASA In A Bind," THE ORLANDO SENTINEL, p. A-8, Feb. 18, 1992.]

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CRIPPEN STATEMENT ON TRULY RESIGNATION

New Kennedy Space Center Director Robert L. Crippen issued the following statement concerning Administrator Truly's resignation: "[Richard H.] Truly is an outstanding leader and a close friend. He has made immeasurable contributions to the nation's space program from his time as an astronaut through his tenure as Administrator. NASA is a stronger, more vigorous agency as a result of Dick's leadership and we will continue to build on the strong foundation he has established." [CRIPPEN STATEMENT, KSC Newsroom, Feb. 13, 1992; Sawyer, THE WASHINGTON POST, pp. A1-A44, Feb. 13, 1992.]

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UNIVERSITY OF FLORIDA WINS KSC CONTRACT

The University of Florida's College of Medicine has been awarded a \$283,070 contract to provide emergency medical physicians at Kennedy Space Center during Space Shuttle launches and landings. This is the renewal of an agreement signed originally in 1980. The four university physicians, who are uniquely skilled trauma specialists, will work with and enhance the capabilities of the KSC medical staff who are located throughout the space center during launch and landing operations. If a mishap were to occur during launch or landing, two of the university physicians and KSC medical personnel would travel in a triage van to the site of the accident to treat and stabilize any of the astronaut crew who might be injured. The two remaining university physicians would be stationed at the Occupational Health Facility to assist NASA and EG&G Florida Inc. medical personnel as needed. Shands Hospital (University of Florida, Gainesville, FL) has been designated as the primary medical care facility for the astronauts. If injuries to crew members were severe enough to call for an emergency airlift, U.S. Air Force helicopters would transport the astronauts, under the care of Air Force physicians, to Shands if their conditions allowed the time necessary. Otherwise, they would be flown to a local hospital. [NASA/KSC Press Release No. 92-17, Feb. 12, 1992.]

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WEATHER DELAYS DISCOVERY FERRY FLIGHT

Inclement weather has held up the return of Discovery from California. KSC spokesman **Mitch Varnes** said, "We'll just have to wait and see how it goes." Weather conditions will dictate the departure time; fog is expected to be in the area. Meanwhile, Atlantis has been towed from its processing hangar to the Vehicle Assembly Building to be mated with its external tank and solid rocket boosters. Rollout to Launch Complex 39A is expected next week. [Banke, FLORIDA TODAY, p. 4A, Feb. 14, 1992, Halvorson, FLORIDA TODAY, p. 7A, Feb. 15, 1992; Halvorson, FLORIDA TODAY, p. 1A, Feb. 16, 1992.]

February 13:

TRULY PREDICTS TOUGH TIME FOR NASA

NASA Administrator **Richard H. Truly** predicted "rough seas and turbulent times" ahead for the space agency. "What happens on April 2? Well, the truthful answer is I'm not sure. Any time leadership changes in an organization, it can be a time of rough seas and turbulent times. In the Navy when you're entering very tough situations and rough seas, there's a saying called 'steady as she goes.' That's what I'd like to impart to you today," he said to agency employees. [Eisler and Banke, FLORIDA TODAY, p. 4A, Feb. 14, 1992; "Ouster of Truly Might Be Big Blow to NASA," FLORIDA TODAY, p. 8A, Feb. 14, 1992; Holton, THE ORLANDO SENTINEL, Feb. 14, 1992.]

February 14:

ATLANTIS TRANSFERRED TO VAB

Yesterday, Atlantis was transferred from OPF Bay 2 to the Vehicle Assembly Building; first motion occurred at about 9:30 a.m. and the vehicle was in the VAB transfer aisle at 10:10 a.m. Work in progress: hard mate operations to attach the Orbiter to its external tank; tail service mast umbilical mates between the vehicle and the mobile service platform. Monoball umbilical connections are scheduled; rollout to Launch Complex 39A is set for February 20. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 14, 1992.]

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ENDEAVOUR: DRAG CHUTE INSTALLED

In OPF High Bay 1, technicians have installed a drag chute in the Space Shuttle Endeavour and placed a camera in the vehicle's midbody section. Work in progress: potable water system checks; external tank door functional tests; TACAN installations; flight deck work and checkouts; midbody and wing closeouts; installation of drag chute door; thermal barrier work; auxiliary power unit heater checks. Technicians have also scheduled tests of Endeavour's landing gear functions. **[KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 14, 1992.]**

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COLUMBIA: POWER ON

Workers in OPF High Bay 3 have completed cleaning Columbia's aft compartment and installed strongbacks on payload bay doors. Work in progress: preparations to open the vehicle's payload bay doors and removal of the last ferry kit items. Power on operations are scheduled. **[KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 14, 1992.]**

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DISCOVERY MATED FOR FERRY FLIGHT

The Orbiter was mated to its 747 Shuttle Carrier Aircraft last night at about 11:00 p.m., EST. Managers at Dryden hope to fly Discovery and the 747 to Biggs Army Air Field (El Paso, TX) for a refueling stop. If weather permits, the vehicle may continue on to Kelly Air Force Base (San Antonio, TX) where it will remain overnight. The trip will continue February 15 with another refueling stop at Columbus Air Force Base (Columbus, MS). Columbia will most likely remain there through the night though it may be carried as far east as Eglin Air Force Base (Eglin AFB, FL). At this point it is unlikely the Orbiter will arrive back at Kennedy Space Center before midday on February 16. **[KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 14, 1992.]**

February 16:

29TH SPACE CONGRESS LINEUP

New Kennedy Space Center Director Robert L. Crippen will make the keynote address at the 29th annual Space Congress in Cocoa Beach, FL, this year. Sponsored by the Canaveral Council of Technical Societies, the speakers will address topics including Department of Defense space operations, Space Shuttle operations and payloads, space education and plans for the space station and trips to the Moon and Mars. This year's Space Congress will feature the following speakers: [See Table next page.]

SPEAKER	POSITION
ROBERT L. CRIPPEN	DIRECTOR, KENNEDY SPACE CENTER
BRIG. GEN. JIMMEY MORRELL	COMMANDER, 45TH SPACE WING, PAFB
RICHARD KOHRS	DIRECTOR, SPACE STATION FREEDOM, NASA
LT. GEN. EDWARD BARRY JR.	COMMANDER, AIR FORCE SPACE SYSTEMS DIVISION (LOS ANGELES, CA)
LT. GEN. THOMAS MOORMAN JR.	COMMANDER, AIR FORCE SPACE COMMAND, PETERSON AFB (CO)
BREWSTER H. SHAW JR.	DEPUTY DIRECTOR, SPACE SHUTTLE OPERATIONS, KSC
ROBERT BROWN	DEPUTY ASSOCIATE ADMINISTRATOR, OFFICE OF HUMAN RESOURCES & EDUCATION, NASA
STEVEN HAWLEY	ASSOCIATE DIRECTOR, AMES RESEARCH CENTER (MOFFETT FIELD, CA)
MICHAEL GRIFFIN	DIRECTOR, OFFICE OF EXPLORATION, NASA
JAMES ROSE	DIRECTOR, OFFICE OF COMMERCIAL SPACE, NASA
GREGORY RECK	DIRECTOR, OFFICE OF SPACE TECHNOLOGY, NASA
HOWARD BENEDICT	EXECUTIVE DIRECTOR, MERCURY SEVEN FOUNDATION

[*Stars of Space Program Head to 29th Annual Space Congress,* FLORIDA TODAY, p. 9E, Feb. 16, 1992.]

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LC 39B READY FOR ENDEAVOUR

"The pad [LC 39B] and all the supporting structures will be ready for Endeavour's launch," according to S. W. "Buz" Brown, Pad Manager for Lockheed Space Operations Co. "We've been able to accomplish some major modifications. It was a major effort across the board," added Gale Christensen, LSO Supervisor of Integrated Operations at LC 39B. [Halvorson, FLORIDA TODAY, p. 10E & 9E, Feb. 16, 1992.]

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DELTA MISSION RESCHEDULED

A Delta rocket carrying a Navstar satellite is scheduled for liftoff from Cape Canaveral Air Force Station February 18 between 5:49 p.m. and 6:20 p.m. "It will be nice to see the Navstars flying again," said Air Force spokeswoman Terri Bracher. Navigational and contamination problems have grounded the Navstar launch program since last July. The

Delta mission was originally planned to begin February 4, but a fuel leak in the rocket's second stage delayed the liftoff. A faulty valve has been replaced; tests on the valve were completed this week. [Halvorson, FLORIDA TODAY, Feb. 13, 1992; Halvorson, FLORIDA TODAY, p. 10E, Feb. 16, 1992.]

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DISCOVERY HOME AGAIN

Once again, Kennedy Space Center has on hand the full, four-Shuttle fleet. Discovery landed atop its 747 Shuttle Carrier Aircraft today at 1:44 p.m., after a flight from Kelly Air Force Base (San Antonio, TX). In the 747 were dozens of KSC workers who had been in California preparing the Orbiter for its ferry flight to Florida. Chris Fahey, KSC Manager of Orbiter Prelaunch Processing, said, "It's nice to see the team come back. They've been out in California for a long time. We're definitely glad to see Discovery home." Early Sunday, Columbia was flown to Columbus Air Force Base (Columbus, MS) for a refueling stop before continuing to Brevard County where the paired vehicles descended to 2,000 feet above the Atlantic Ocean; it flew north and south several times along the beach from KSC to Patrick Air Force Base to show off Discovery to crowds below. "I think it's nice to do it for the people because it's their airplane," said Frank Marlow, pilot of the SCA. Modifications to Discovery will be done at Kennedy Space Center to save money; Columbia has just returned from Palmdale, CA, where it underwent extensive modifications. Discovery will go to the VAB sometime in September to prepare it for an October launch, according to Fahey. Atlantis, meanwhile, is on target for its expected March 23 launch; the Orbiter is currently in the VAB for mating and testing and will be rolled to Launch Complex 39A on February 20. [Banke, FLORIDA TODAY, p. 3A, Feb. 17, 1992.]

February 18:

DELTA LAUNCHES TONIGHT

Despite stormy weather and heavy cloud cover the Air Force hoped to launch a Delta 2 rocket this evening between 5:49 p.m. and 6:20 p.m. bringing to an end a seven-month delay in launches of navigation satellites. The Delta would place into orbit the sixth Global Positioning System Satellite; the last one launched was July 3, 1991. The launch was postponed because of thick clouds over the launch pad, according to officials. On the 19th the window extends from 5:45 p.m. till 6:16 p.m.; Air Force meteorologists suggest, however, that the weather for the 19th is also forbidding - just a 10 percent chance of favorable conditions. Air Force rules prohibit launches under cloudy conditions because of the danger of lightning strikes. [Date, THE ORLANDO SENTINEL, p. A-4, Feb. 18, 1992; Banke, FLORIDA TODAY, p. 1A, Feb. 18, 1992; Halvorson, FLORIDA TODAY, p. 1A, Feb. 19, 1992.]

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ATLANTIS: SHUTTLE INTERFACE TEST

The Shuttle Interface Test is underway in OPF Bay 2 where Atlantis is being prepared for its STS 45 mission; electrical connections between Atlantis and its external tank were completed February 15. Rollout to Launch Complex 39A is set for February 20. On February 27, the STS 45 crew will fly to KSC to take part in the Terminal Countdown Demonstration Test, looking to a launch on March 23. Atlantis will carry a Spacelab pallet of instruments designed to study Earth's atmosphere and the sun's effect on it. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 18, 1992; "KSC Workers Prepare Atlantis For Thursday's Trip to Launch Pad," FLORIDA TODAY, p. 2A, Feb. 18, 1992; Banke, FLORIDA TODAY, p. 5A, Feb. 19, 1992.]

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ENDEAVOUR: FUEL CELLS HOOKED UP

In OPF Bay 1 where Endeavour is being processed for its maiden voyage - STS 49 - technicians have hooked up the Orbiter's fuel cells. Work in progress: tests of the Tacan system; leak and functional tests of the waste containment system; checks of the system for the extravehicular mobility units; configuring the aft flight deck for the STS 49 mission. A Crew Equipment Interface Test with the STS 49 flight crew is scheduled for this weekend. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 18, 1992.]

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COLUMBIA: MOCK OMS POD REMOVAL

A functional test of Columbia's radiators is underway in OPF Bay 3 where technicians are also removing the mock right orbital maneuvering system pod and the main propulsion system temperature probes and check valves. The left mock OMS pod will be removed on February 20. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 18, 1992.]

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DISCOVERY IN OPF BAY 2

Having finally returned from California, Discovery is now in Orbiter Processing Facility Bay 2 where preparations are underway to open the Orbiter's payload bay doors; remove the ferry flight tail cone and to power up the vehicle. Post-flight inspections and deservicing operations are also underway. On February 23, the International Microgravity Laboratory payload will be removed. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 18, 1992.]

February 20:

COHEN NAMED ACTING ADMINISTRATOR

NASA Administrator Richard H. Truly today announced the appointment of Aaron Cohen, Director of the Johnson Space Center, as Acting Deputy Administrator. In making this announcement, Truly said, "Aaron Cohen's appointment, which has been closely coordinated with the White House, is one that pleases me greatly. Aaron's long experience as a top-flight engineer and manager will assist me greatly in the day-to-day operations of the agency until my departure on April 1, 1992, and also provide for continuity in the transition period as the President nominates and the Senate confirms a new Administrator and Deputy Administrator. Roy S. Estess, Director of the Stennis Space Center, MS, will remain in his temporary role as Special Assistant to the Administrator. Cohen has been Director of the Johnson Space Center since October 1986. He came to NASA in 1962 in the Apollo Spacecraft Program Office at the Manned Spacecraft Center (now Johnson Space Center). He served in various capacities at the center prior to being named Center Director. Upon completion of this assignment, Cohen will return to his permanent position as the JSC Director; during his absence, Paul J. Weitz, Deputy Center Director, will be Acting Director. ["Cohen Named Acting Deputy Administrator," NASA News Release No. 92-25, Feb. 20, 1992; Banke, FLORIDA TODAY, p. 1A, Feb. 21, 1992; Holton, THE ORLANDO SENTINEL, pp. A-1 & A-5, Feb. 21, 1992; "Truly's Forced Resignation Draws Fire In Congress," FLORIDA TODAY, Feb. 23, 1992.]

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GLENN'S FLIGHT WAS THIRTY YEARS AGO

John Glenn is now a United States Senator (D-OH), but thirty years ago he became the first American to orbit the Earth. "It's a rare day that goes by that someone doesn't ask or comment about the space days," he says. "I've recalled it so often, almost daily, that it really seems to be that the whole thing was a month ago." He followed Russians Yuri Gagarin and Gherman S. Titov who were the first two persons to orbit the globe. "I'd like

to go up again. I already told them, and I was only half joking, that when they get around to doing a geriatric study, they've already got a baseline on me. I'm available." Glenn is 70 years old. ["Glenn's Story Keeps Him Flying High On Earth," THE ORLANDO SENTINEL, Feb. 20, 1992; Willette, FLORIDA TODAY, pp. 1A-2A, Feb. 20, 1992.]

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ROLLOUT OF ATLANTIS

The Space Shuttle began the first leg of its STS 45 mission today when it was rolled out to Launch Complex 39A; the trip began at 11:04 p.m. February 19 and was concluded with a hard down status at the pad at 5:30 a.m. The rotating service structure was extended around the Orbiter. Bad weather prevented an even earlier rollout. A countdown demonstration test is set for February 26-27. At LC 39A, workers are making connections between the pad and the vehicle elements, preparing to power up Atlantis and to remove two auxiliary power units. KSC spokeswoman Lisa Malone said "We have a healthy amount of contingency time built into the schedule so we're looking good for a launch at the end of March." [Banke, FLORIDA TODAY, p. 4A, Feb. 20, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 20, 1992; "Space Shuttle Atlantis Moved to Launch Pad," THE ORLANDO SENTINEL, Feb. 21, 1992.]

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STS 45 UPDATE: ATLANTIS AT PAD

Atlantis' arrival at launch pad 39A early this morning marked a visible step toward the STS 45 launch planned next month. Shuttle processing team members set an Orbiter Processing Facility (OPF) record in getting Atlantis ready for the upcoming launch. Atlantis spent 55 days in the OPF, breaking the previous record of a 60-day OPF flow set during the STS 43 processing operations last year, also with the Shuttle Atlantis. Flight preparations for Atlantis' 11th flight, STS 45, began December 9 following its last mission, STS 44, which ended with a landing at Edwards Air Force Base, CA. While in the OPF, the three Space Shuttle main engines were installed. Engine locations for this flight are as follows: engine 2024 in the No. 1 position, engine 2012 in the No. 2 position, and engine 2028 in the No. 3 position. These engines were installed on January 10-11. Technicians installed the ATLAS payload, the primary objective of Mission STS 45, into Atlantis' payload bay on January 25, while the vehicle was in the OPF. The Shuttle Solar Backscatter Ultraviolet Experiment was installed in the payload bay on January 28. The payload was closed out for flight in the OPF on February 9.

The Crew Equipment Interface Test with the STS 45 flight crew was conducted in the OPF on February 1. The crew became familiar with the configuration of the Orbiter, the ATLAS payload and unique equipment for Mission STS 45. Stacking operations for the solid rocket boosters began December 10 on mobile launcher platform 1, and were completed by January 15. The external tank was mated to the boosters on January 22 and the Orbiter Atlantis was transferred to the Vehicle Assembly Building February 13, where it was mated to the external tank and solid rocket boosters. A dress rehearsal launch countdown involving the flight crew is scheduled for February 26-27. The STS 45 crew will arrive at KSC on February 25 for the test. While here, they will receive training in emergency egress procedures at the launch pad and at the runway. On February 27, the crew members will don their flight suits and practice getting ready for an actual launch day. The test will end at 11 a.m. EST, February 27, with a simulated main engine cutoff.

Charles F. Bolden is the STS 45 Commander and Brian Duffy, is the Pilot. Three Mission Specialists include: Michael C. Foale, Kathryn D. Sullivan and David C. Leestma. The two Payload Specialists are Byron Lichtenberg and Dirk Frimout, a Belgian who represents

the European Space Agency. Mission STS 45, scheduled for eight days, is part of NASA's Mission to Planet Earth, a large-scale, unified study of planet Earth as a single, dynamic system. Scientists will gather new information to gain a better understanding of how the atmosphere reacts to natural and human-induced atmospheric changes. This is the first of nine ATLAS missions that will be undertaken throughout the current 11-year solar cycle. The end of mission landing is planned at the KSC Shuttle Landing Facility. KSC's landing convoy teams will be on station to prepare the vehicle for tow to the OPF. Atlantis' next flight will be Mission STS 46 with the Tethered Satellite System and the EURECA payload scheduled for launch this summer. ["Atlantis Arrives at Launch Pad After Setting Processing Record," NASA/KSC News Release No. 20-92, Feb. 20, 1992.]

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ENDEAVOUR: EVA TESTS

In OPF Bay 1, technicians have completed the functional tests of the system for the extravehicular mobility units assigned to Endeavour for its STS 49 mission. A Crew Equipment Interface Test with the flight crew has been scheduled for this weekend. Work in progress: tests of the Tacan system; preparations for the CEIT; leak and functional tests of the waste containment system; configuring the aft flight deck for the STS 49 mission. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 20, 1992.]

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COLUMBIA: RADIATOR TESTS DONE

Functional tests of Columbia's radiators have been completed in OPF Bay 3. Work in progress: removal of the mock left orbital maneuvering system pod; validation of the electrical system; preparations to install the extended duration Orbiter pallet; removal of main propulsion system temperature probes and check valves; installation of thermal blankets. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 20, 1992.]

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DISCOVERY POWERED UP

In OPF Bay 2, Discovery has been powered up by technicians; the tail cone has been removed and the payload bay doors have been opened. Work in progress: disconnecting the International Microgravity Laboratory from the Orbiter and post-flight inspections and deservicing operations. Removal of the IML-1 payload has been scheduled for February 23. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 20, 1992.]

February 21:

ATLANTIS: POWERED UP

At Launch Complex 39A, Atlantis has been powered up in preparation for its STS 45 mission launch next month. Work in progress: making connections between the launch pad and the vehicle elements; preparations to remove two auxiliary power units; preparations for the helium signature leak test of the main propulsion system and three main engines. Work scheduled: the helium signature leak test for February 23 and the Terminal Countdown Demonstration Test for February 26-27. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 21, 1992.]

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ENDEAVOUR: CEIT SCHEDULED

Endeavour's Crew Equipment Interface Test has been scheduled with the flight crew to occur this weekend. Work in progress: functional test of the galley; check of the waste containment system; tests of the Tacan system; preparations for the Crew Equipment Interface Test (CEIT); leak and functional tests of the waste containment system;

configuring the aft flight deck for the STS 49 mission. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 21, 1992.]

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COLUMBIA: MOCK LEFT OMS POD REMOVED

Technicians in Orbiter Processing Facility Bay 3 have removed the mock left orbital maneuvering system pod which Columbia carried during its ferry flight from California. Work in progress: validation of the electrical system; preparations to install the extended duration Orbiter pallet; installation of thermal blankets. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 21, 1992.]

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DISCOVERY: REMOVAL OF IML SCHEDULED

On February 23 technicians will remove the International Microgravity Laboratory payload from Discovery's cargo bay. Work in progress: disconnecting the International Microgravity Laboratory; removing the IML tunnel; preparations to offload residual hypergolic propellants. [KSC SHUTTLE STATUS REPORT, 10 a.m., Feb. 21, 1992.]

February 22:

ENDEAVOUR'S CREW ARRIVES TODAY

Endeavour's STS 49 crew arrives today at Kennedy Space Center to view the new Orbiter for their first time. KSC spokeswoman Lisa Malone said, "This will give them a chance to be around the Orbiter they'll be living and working in during their mission." The crew will enter the crew cabin while the Orbiter is in OPF Bay 1 today to familiarize themselves with the flight deck, mid-deck and its airlock and payload bay. The STS 49 crew includes: Commander Daniel C. Brandenstein, Pilot Kevin P. Chilton and mission specialists Thomas D. Akers, Richard J. Hieb, Bruce E. Melnick, Kathryn C. Thornton and Pierre Thuot. One of Endeavour's APUs is being replaced because its manufacturer, Sunstrand Corp. (Rockford, IL), found corrosion in a similar unit's fuel pump. Another APU scheduled for removal is suspected of having a bad weld on a valve. [Halvorson, FLORIDA TODAY, p. 4A, Feb. 22, 1992.]

February 23:

SPACEHAB WORK UNDER WAY

Workers at Port Canaveral have begun to prepare Spacehab, a 10-foot long, 13-foot diameter container, for a 1993 Space Shuttle mission. Spacehab is a private, commercial venture unlike the Spacelab venture which is sponsored by the European Space Agency. Riding in the Orbiter's payload bay, Spacehab is connected to the crew cabin by a short tunnel. The first of two flight-worthy modules arrived here from their Italian manufacturer on Feb. 12. According to Spacehab's Senior Manager of Ground Operations Bill Spradlin, the experiment container will be given a detailed cleaning, then prepared for transport to Kennedy Space Center where it will be tested in preparation for a June 1993 flight. [Banke, FLORIDA TODAY, p. 10E, Feb. 23, 1992.]

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MCCARTNEY TO GET DEBUS AWARD

The Kurt H. Debus Award will be awarded this year to former Kennedy Space Center Director Forrest S. McCartney. The Chairman of the National Space Club Florida Committee John Mansur said of McCartney, "He's just the perfect selection." He cited McCartney's leadership in returning the Space Shuttle Program to flight after the Challenger accident in January 1986. Previous winners include George Page and Lyle Holloway. The guest speaker will be former NASA Administrator James Beggs. ["Former

KSC Director to Receive Debus Award," FLORIDA TODAY, p. 9E, Feb. 23, 1992; "Former KSC Director Joins Honored Roll," FLORIDA TODAY, p. 2B, March 8, 1992.]

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GALLO WINS SILVER SNOOPY

Pat Gallo, a planning specialist for Lockheed Space Operations Co., was presented the coveted Silver Snoopy Award by astronaut James H. Newman. Gallo, a senior member of the Shuttle Processing Contract Team manifest planning office, works in the Integrated Advanced Planning Directorate at the space center. ["Merritt Island Man Wins Silver Snoopy," FLORIDA TODAY, p. 9E, Feb. 23, 1992.]

February 25:

STS 45 CREW ARRIVES

The seven-member astronaut crew for the STS 45 mission arrived at the Shuttle Landing Facility in T-38s this morning at about 7:40 a.m. KSC spokesman Karl Kristofferson said, "They're coming here primarily for a dress rehearsal of the actual countdown. It's an opportunity for the flight crew and the launch team to get together and work out any problems." The standard contingency training for the crew is underway which this afternoon involves driver training in the M-113 escape vehicle. Early this evening before dinner the Commander and Pilot will fly the Shuttle Training Aircraft. Tomorrow will be a safety training walkdown of the launch pad. Meanwhile, at Launch Complex 39A, vehicle power is up and in the aft main engine compartment the helium signature leak check of the main propulsion system and the three main engines is in process. Preparations are underway for the upcoming loading of storable propellants which will begin later this week. Work is currently in progress to remove the two auxiliary power units recommended for changeout by the vendor. On the flight deck, the inertial measurement units are undergoing calibration. [Diller, KSC STATUS REPORT, 11:45 a.m., Feb. 25, 1992; Banke, FLORIDA TODAY, p. 2A, Feb. 25, 1992.]

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FOALE: KSC MOST SPECIAL PLACE

To astronaut Michael C. Foale, Kennedy Space Center "is the most special place in America, as far as the future goes, and maybe even the world. It's from here that we can go initially to orbit, then the planets, and I hope one day to the stars," he said. "I came all the way from Great Britain, where I was educated, to Houston, and now here I am in Florida getting ready to take what I consider to be a first step toward the stars," he added. Maybe I won't go to the stars, but maybe my grandchildren will." Foale is at the space center to take part in the Terminal Countdown Demonstration Test which precedes his STS 45 mission, currently scheduled to launch on March 23. [Halvorson, FLORIDA TODAY, p. 4A, Feb. 26, 1992.]

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PRESIDENTIAL AWARD WINNERS, KSC

Former KSC Director Forrest S. McCartney, KSC Launch Director Robert B. Sieck and Alan J. Parrish, KSC Director of Safety, Reliability and Quality Assurance, will receive the Presidential Rank Award for Meritorious Executive at a ceremony February 26, at NASA Headquarters in Washington, D.C. NASA Administrator Richard H. Truly will present the award which is given to senior executive service members of the federal government whose performance is exceptional for a period of at least three years. ["KSC Managers to Receive Presidential Award," NASA/KSC News Release No. 21-92, Feb. 25, 1992; "Three Space Veterans Win Prestigious Award," FLORIDA TODAY, p. 9E, March 1, 1992.]

February 26:

MARS OBSERVER ROCKET ARRIVES

The Titan III rocket which will launch the Mars Observer spacecraft on an interplanetary trajectory later this year is scheduled to be offloaded from an Air Force C-5A transport plane on Cape Canaveral Air Force Station (CCAFS) on February 28, at 9 a.m. The booster, which was built by Martin Marietta (Denver, CO) is targeted for liftoff at the start of the Mars planetary launch window which opens September 16. Mars Observer is the first mission to that planet since the Viking Program in 1976. It is the initial spacecraft in a series of lower cost 'observer class' planetary missions developed by Jet Propulsion Laboratory (JPL) (Pasadena, CA) that will explore objects in the inner solar system such as Venus, the Moon, Mars, and near-Earth asteroids and comets. NASA Space Science Chief Lennard A. Fisk said, "The Mars Observer mission is important because it will give us very detailed information about Mars - data that is substantially different than we've previously had in terms of possible life or water on Mars. The data will lay the foundation for future generations to explore the planet." The Titan III launch vehicle will be moved to the Vertical Integration Building (VIB) on Cape Canaveral Air Force Station for prelaunch processing. Early in July, the vehicle will have two solid rocket boosters attached and then be moved to a completely rebuilt Launch Complex 40. ["Note to Editors and Broadcast News Directors: Titan III Rocket for Mars Observer Arrives at Cape Canaveral," NASA/KSC News Release No. 23-92, Feb. 26, 1992; Halvorson, FLORIDA TODAY, p. 4A, Feb. 29, 1992.]

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INTELSAT BOOSTER ARRIVES AT KSC

The solid fuel rocket stage that a pair of NASA astronauts will attach to a stranded Intelsat satellite during the Space Shuttle Endeavour's first mission arrived this morning at KSC's Vertical Processing Facility (VPF). The capture bar which will be used by the crew to grapple the satellite was installed on the booster cradle this afternoon. The upper stage will propel the satellite to its proper orbit which was not successfully accomplished after launch aboard a Titan expendable rocket two years ago. Tomorrow, the stage contained within its cradle will be rotated and hoisted into the east test cell of the VPF. On February 29, a "stand alone" electrical test of the booster with its associated cradle will be conducted. Members of the STS 49 crew are expected to be at KSC next month for a "sharp edge" inspection of the booster. Installation into the payload canister will occur during the first week of April so that the stage can be transported to Pad 39B to await the arrival of the Space Shuttle Endeavour. The stage was integrated with the cradle at Astrotech (Titusville, FL) earlier this month by Hughes Aircraft engineers prior to its arrival at KSC. ["Upper Stage Booster for Endeavour's Intelsat Rescue Mission Arrives at KSC," NASA/KSC News Release No. 24-92, Feb. 26, 1992.]

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VAB: ENDEAVOUR TO BE TARDY

With its move to the VAB now scheduled for March 2, Endeavour's processing managers are concerned that the necessary paperwork may not be completed on time. "Right now it's tight, but we feel we can make it," said John "Tip" Talone, NASA manager in charge of preparing the newest Orbiter for space flight. He said that technicians must still complete tests of Endeavour's flight control and nosewheel steering systems and the aft engine compartment must be closed out before the vehicle is ready for its STS 49 mission to rescue the Intelsat Satellite, now in an incorrect orbit. [Halvorson, FLORIDA TODAY, p. 6A, Feb. 27, 1992.]

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EARTH ATMOSPHERIC STUDY

The Earth's atmosphere will get extensive every year or two when Space Shuttles carry instruments to measure the degradation of the atmosphere over an 11-year solar cycle. Atlantis' STS 45 will be the first of these missions "about finding out important answers about the Earth on which we live and how we can better survive for generations and generations to come," according to STS Commander Charles F. Bolden. "If we get half the answers we are seeking, then I think we'll all be better by it and our kids will be better by it and our grandkids will be better by it." Bolden and the six other members of his crew are at Kennedy Space Center for the terminal countdown demonstration test currently underway. [Halvorson, FLORIDA TODAY, p. 6A, Feb. 27, 1992.]

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BATTERY PROBLEM DELAYS ATLAS LAUNCH

"We're now proceeding with a plan to launch...on Friday (February 29) at 6:09 p.m. local time, at the opening of a three-hour, 30-minute window," said Marty Winkler, General Dynamics Space Systems Division vice president for launch operations. A battery problem has delayed the launch which was scheduled for February 27; two spare batteries are being activated and tested; one will be installed in the Atlas rocket early today, according to Winkler. [Banke, FLORIDA TODAY, p. 6A, Feb. 27, 1992.]

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TRULY: CHALLENGER CRIPPLED NASA'S REPUTATION

NASA Administrator Richard H. Truly told the National Space Club that the Challenger accident claimed the lives of all seven of its astronauts but also crippled NASA's reputation. "NASA no longer was the paragon of excellence, and the second-guessers moved in," he said. "I thought my job was to discover the cause, fix it, ensure future safety and reliability and return the Space Shuttle to safe flight. I quickly discovered, however, I was embroiled in politics, budgets and a critical re-examination of NASA, all surrounded by a media zoo." He denied that NASA was without direction. "NASA knows precisely where it is headed," Truly asserted. He told the National Space Club that without solid funding, the space agency is "in jeopardy....and it is not helped by what passes in this town for analysis. The cheap shots must end. Without teamwork, there is nothing. Give the new administrator your best advice and support, but don't whisper your thoughts into the ear of your favorite Washington armchair analyst," he said. Truly's resignation as Administrator takes effect April 1. ["Truly: Stop 'Cheap Shots' Against NASA," FLORIDA TODAY, p. 1A, Feb. 27, 1992; Hoversten, USA TODAY, p. 1A, Feb. 27, 1992.]

February 27:

FIBER-OPTIC CABLE CONTRACT

Network Systems Solutions (Denver, CO) has been awarded a \$1,249,990 contract to install fiber-optic cable at Kennedy Space Center. Under the fixed price contract, the small business firm will have 18 months to install cable between several Space Shuttle vehicle processing, payload processing, launch and control facilities, as well as communications switching centers at the space center, a network which is approximately ten miles long. One linkup will be between the Launch Complex 39 area's switching center, the Vehicle Assembly Building Repeater (VABR) and the new Processing Control Center (PCC).

Another section will tie the PCC with the Launch Control Center (LCC). The LCC will be linked with separate connections to the VABR and both Shuttle Launch Pads 39A and

39B. Other installations will be made between the solid rocket booster Assembly and Refurbishment Facility (ARF) and the Communications Distribution and Switching Center (CDSC) in the KSC Industrial Area. Still another fiber-optic connection will be made between the VABR and the Orbiter Processing Facility (OPF).

This contract makes up Phase IX of fiber-optic cable installation at KSC. The first installations began in 1985. The new cable will increase the KSC communication system's capacity and expand the several miles of cable that has already been installed at the 140,000-acre space center. Eventually, most KSC facilities will be linked with this advanced communications hardware. The fiber-optic cable at KSC carries digitized communications data at a much higher rate than in-place X-band copper wire and provides more capabilities than the old hardware. A system that allows high-speed computers to relay Space Shuttle Orbiter test and status data from processing areas and launch pads to the LCC is essential to the success of Shuttle missions. [NASA/KSC News Release No. 22-92, Feb. 27, 1992.]

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BAD BOOSTER DELAYS ATLAS LAUNCH

A problem with a commercial Atlas' booster avionics system has delayed launch until at least March 2. This marks the second delay in the effort to launch a Galaxy 5 communications satellite for Hughes Communications Inc. (Los Angeles, CA). There will be three opportunities on March 2 to launch the rocket. ["Bad Booster Bumps Atlas Liftoff," FLORIDA TODAY, p. 2A, Feb. 28, 1992.]

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STS 45 ASTRONAUTS PRACTICE

The STS 45 crew of Atlantis, along with the Kennedy Space Center launch team, successfully concluded the terminal countdown demonstration test, according to KSC spokesman Bruce Buckingham: "We had a good test; there were un unexpected hitches." The crew spent the final hours of the test in the crew cabin of Atlantis, but earlier in the day they practiced emergency escape procedures at Launch Complex 39A. There are seven steel baskets located at the top of LC 39A to help astronauts evacuate a Space Shuttle if the need arose. [Halvorson, FLORIDA TODAY, p. 2A, Feb. 28, 1992.]

February 29:

PRICE HIKE: TOURS & IMAX THEATER

Starting tomorrow, March 1, the cost of KSC tours will rise to \$7 for adults and \$4 for children, ages 3 to 11; that represents a dollar increase in each price. IMAX Theater tickets will also increase to \$4 (up \$1.25) for adults and \$2 for children (up 25 cents). George Meguiar, Marketing Director for Spaceport USA, said the increases "just normal business practices." He remarked that in recent months the attraction had added two new exhibits: "Spinoffs from Space" and "Space Station" and that the full-size Shuttle replica called Ambassador will not be heading for Europe as scheduled, but will stay at Kennedy Space Center for at least another year. Meguiar said, "It is our intention to always have a Shuttle here, although I couldn't tell you now what will happen next year." The Spaceport has also undergone recent expansion in souvenir shop, the Gift Gantry. [Cook, FLORIDA TODAY, p. 1A, Feb. 29, 1992.]

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ATLAS LAUNCH: MARCH 5

The launch of an Atlas rocket has been delayed again until March 5 because more time is needed to replace a faulty part than was originally anticipated. The problem is in a battery that powers the rocket's self-destruct system. Launch on Thursday (March 5) may come during one of three possible windows: 6:07 and 7:14 p.m.; 7:39 and 7:57 p.m.; and between 8:22 and 8:35 p.m. ["Atlas Launch Set for Thursday," FLORIDA TODAY, p. 4A, Feb. 29, 1992.]

MARCH

March 2:

STS 45: APU LINES CONNECTED

On Launch Complex 39A, the Space Shuttle Atlantis has had its APU fuel lines connected. Work in progress: servicing the auxiliary power units (APUs) with lube oil; preparations to load hypergolic propellants into the Orbiter's onboard storage tanks. Scheduled work includes: a hot firing of the two APUs March 5 to verify their operability and a Flight Readiness Review on March 10. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 2, 1992.]

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ENDEAVOUR: PAYLOAD BAY DOORS CLOSED

In Orbiter Processing Bay 1, technicians have closed the payload bay doors and conducted a frequency response test of the aerosurfaces of the Space Shuttle Endeavour. Work in progress for the STS 49 mission: final powering down of the Orbiter; closeouts of the aft compartment; final inspections and cleaning. Endeavour is scheduled for a rollover to the Vehicle Assembly Building on March 4; there it will be mated with its external tank and solid rocket boosters beginning at 8 a.m. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 2, 1992.]

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COLUMBIA: OMS POD INSTALLED

In OPF Bay, workers readying Columbia for its STS 50 mission have installed the orbiter's right orbital maneuvering system (OMS) pod; the left pod will be installed tomorrow (March 3). Work in progress: tests of the power reactant storage and distribution system; preparations to install the extended duration Orbiter pallet; and tests of the right OMS pod. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 2, 1992.]

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DISCOVERY: DECONFIGURATIONS

Technicians are busy in OPF Bay 3 removing the forward reaction control system and the heat shields around the main engines of the Space Shuttle Discovery. They are also offloading residual fluids and deconfiguring the Orbiter's payload bay. Discovery is scheduled to undergo extensive modifications of the sort recently made upon the oldest Space Shuttle, Columbia. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 2, 1992.]

March 4:

STS 45: APU CLOSEOUT ON ATLANTIS

At Launch Complex 39A, technicians have closed out Atlantis' APUs and are loading hypergolic propellants into the Orbiter's onboard storage tanks that feed the forward reactions control system thrusters and both orbital maneuvering system engines. Hydrazine will be loaded into the Orbiter's auxiliary power units and the booster's hydraulic power units. Work scheduled: a hot firing of the two APUs March 5 between 11 a.m. and noon; a Launch Readiness Review is set for March 5 and a Flight Readiness Review scheduled for March 10. The reviews are routinely scheduled, according to KSC spokeswoman Lisa Malone. She said, "We basically review everything to make sure KSC is ready to support the launch, mission and landing." The firm launch date - now targeted for March 23 - will be set after the March 10 meeting. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 4, 1992; Banke, FLORIDA TODAY, p. 5A, March 4, 1992.]

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ENDEAVOUR READIES FOR STS 49

The aft compartment of the Space Shuttle Endeavour has been closed out by technicians in OPF Bay 1; closeouts of the crew cabin are in progress as are final inspections and cleaning. Work scheduled: determining the Orbiter's weight and center of gravity; bolting the Orbiter atop the transporter; inspections of the main landing gear doors; transfer of Endeavour to the Vehicle Assembly Building for mate with the external tank and solid rocket boosters now targeted for the afternoon of March 5. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 4, 1992.]

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COLUMBIA: TESTS IN PROGRESS

Tests of the power reactant storage and distribution system and of the right orbital maneuvering system (OMS) pod are in progress on Columbia in OPF Bay 3. Technicians are also making connections of the left orbital maneuvering system pod and preparing to install the Extended Duration Orbiter (EDO) pallet which is scheduled to be transferred from the VAB to the OPF March 5. Installation of the EDO in Endeavour is scheduled for early next week. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 4, 1992.]

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DISCOVERY IN PROCESSING

The Space Shuttle Discovery is in OPF Bay 2 for processing; technicians are currently offloading residual fluids, beginning extensive structural inspections in the midbody area of the Orbiter and undertaking drying operations for the main engines. The three main engines are scheduled for removal next week. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 4, 1992.]

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ATLAS DELAYED FOR TESTS

The launch of an Atlas rocket at Cape Canaveral Air Force Station for March 5 has been rescheduled for March 10 because engineers have ordered more tests of parts replaced since problems surfaced last week with the guidance and flight control systems. "There are no other problems that we are working on and we really feel confident that next Tuesday [March 10] is going to be the day we launch," said Jack Isabel, spokesman for General Dynamics which manufactured the Atlas rocket. ["Engineers Postpone Launch of Atlas Rocket for Testing," FLORIDA TODAY, p. 5A, March 4, 1992.]

March 5:

ATLANTIS: HOT FIRING TONIGHT

Technicians at Launch Complex 39A who are readying Atlantis for its STS 45 mission have loaded hypergolic propellants into the Orbiter's onboard storage tanks that feed the forward reaction control system thrusters and both orbital maneuvering system engines. Hydrazine was loaded into the Orbiter's auxiliary power units and the booster's hydraulic units. Work in progress: preparations to perform tonight's hot firing of two auxiliary power units (APUs); disconnecting lines used in the hypergolic loading operation; reopening the launch pad this afternoon. An improved APU now in slot NO. 2 will run for 12 minutes tonight; the other APU, in slot No. 1, will run for 7 minutes. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., March 5, 1992.]

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ENDEAVOUR: TITANIUM SOCKET BULGE

Closeouts of Endeavour's crew cabin are underway in OPF Bay 1 where technicians are taking measurements and sanding the liquid oxygen socket where the external tank connects to the Orbiter. Engineers found a slight bulge in the titanium socket that needs to be sanded for a correct fit. The socket's aluminum liner is also being sanded. Work scheduled: determining the Orbiter's weight and center of gravity; bolting the Orbiter atop the transporter; inspections of the main landing gear doors; transfer of Endeavour to the Vehicle Assembly Building for mate with the external tank and solid rocket boosters now targeted for tomorrow (March 6) evening. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., March 5, 1992.]

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COLUMBIA: EDO PALLET TRANSFERRED TO OPF

The Extended Duration Orbiter Pallet (EDO) has been transferred from the Vehicle Assembly Building to OPF Bay 3 this morning; installation of the pallet is scheduled to occur early next week. Work in progress: tests of the left orbital maneuvering system pod; tests of the power reactant storage and distribution system and of the right orbital maneuvering system pod; preparations to install the EDO. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., March 5, 1992.]

March 6:

STS 45: SUCCESSFUL HOT FIRING

Atlantis' two auxiliary power units (APUs) were successfully hot fired today at 4:30 a.m. today and Launch Complex 39A was reopened for normal work. Pad workers are extending the rotating service structure around the Space Shuttle and draining the APU catch bottles. Scheduled work next week includes: a flight readiness test of the three main engines; ordnance operations; installation of the two contingency space suits and a Flight Readiness Review for STS 45 is set for March 10. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 6, 1992.]

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ENDEAVOUR: CREW CABIN CLOSED OUT

The Space Shuttle Endeavour, awaiting rollover from OPF Bay 1 to the VAB, has had its crew cabin closed out by technicians who have also sanded the liquid oxygen socket where the external tank connects to the Orbiter. "There's no question in my mind that the team went the extra mile in getting Endeavour ready to leave the OPF. The team grabbed the challenge in getting a brand new Orbiter flight ready, overcame many obstacles and demonstrated tremendous teamwork. We're proud of the team and happy to see Endeavour on its way to the launch pad," said Jay Honeycutt, Director of Shuttle Management and Operations. Engineers had found a slight bulge in the titanium socket that would have interfered in connecting the Orbiter to the tank. Processing workers are determining the Orbiter's weight and center of gravity and bolting the Orbiter to the transporter. Scheduled work: inspections of the tiles on the main landing gear doors and rolling the Orbiter over to the Vehicle Assembly Building for mating with the external tank and solid rocket boosters; that occurs tomorrow (March 7) at 8 a.m. Endeavour's maiden voyage, STS 49, is scheduled for late April or early May. [Halvorson, FLORIDA TODAY, p. 2A, March 1, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., March 6, 1992; NASA/KSC News Release No. 27-92, March 6, 1992.]

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COLUMBIA: BOTH OMS PODS TESTED

Both of Columbia's Orbital Maneuvering System (OMS) Pods have been tested while the Orbiter undergoes processing for STS 50 in OPF Bay 3. The Extended Duration Orbiter (EDO) Pallet will be installed in the vehicle next week. Work in progress: leak and functional tests of the auxiliary power units; tests of the electrical system and of the power reactant and distribution system; preparations to install the EDO. [**KSC SHUTTLE STATUS REPORT**, 10 a.m., March 6, 1992.]

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DISCOVERY: RESIDUAL FLUID OFFLOADING

Residual hypergolic propellants from Discovery will take place this weekend. The three main engines and both orbital maneuvering system pods will be removed next week. Currently, technicians are deservicing freon coolant loop No. 2, offloading residual fluids and making extensive structural inspections of Discovery's midbody. Before Discovery's next mission, STS 53, the Orbiter will undergo extensive modifications similar to those made to Columbia last year. [**KSC SHUTTLE STATUS REPORT**, 10 a.m., March 6, 1992.]

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MOBILE SERVICE STRUCTURE MOVED: CCAFS

At Cape Canaveral Air Force Station, Launch Complex 40 got a new 23-story, 11.4 million-pound mobile service tower to enable the launching of commercial Titan rockets from the pad. "This is the biggest rolling vehicle of its kind in the world," said James "Ox" Van Hoften, former astronaut and Senior Vice President of Bechtel National, Inc., which designed and built the tower. The tower will see its first service on the Mars Observer mission launch. At pad 36B, a General Dynamics Corp. Atlas 1 rocket is awaiting launch on March 10. [Banke, **FLORIDA TODAY**, p. 1A, March 9, 1992.]

March 7:

KATZ (LSO) WINS AWARD

Michael Katz, an engineer for Lockheed Space Operations Co., has been awarded the 1992 Robert E. Gross Award. The Gross Award is an annual honor presented by Lockheed in recognition of technical excellence to engineers in the various companies within the Lockheed Corporation. Katz will receive the award later this year at a ceremony in California. ["Lockheed Engineer Captures Award," **FLORIDA TODAY**, March 8, 1992.]

March 9:

ATLANTIS: FRR TOMORROW

The Flight Readiness Review for Atlantis' STS 45 mission will begin tomorrow [March 10]. Ordnance operations and installation of the two contingency space suits will also occur this week. Work in progress: purging the 17-inch umbilical cavity between the external tank and the Orbiter; draining the auxiliary power unit catch bottles and mating the Orbiter midbody umbilical unit to the Orbiter. [**KSC SHUTTLE STATUS REPORT**, 11 a.m., March 9, 1992.]

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CHROME ELECTRIC, INC. CONTRACT

Chrome Electric, Inc. (Titusville, FL) has been awarded a \$518,480 contract for the installation of a fire alarm system for launch control and processing facilities at Kennedy Space Center. The small business firm will link fire detection sensors and audible alarms in the Vehicle Assembly Building (VAB), two Orbiter Processing Facility (OPF) high bays and the Launch Control Center (LCC) to a central monitor station in one room of the LCC.

In the case of a fire, the monitoring system's computerized digital display will provide a precise guide for KSC firefighters as to the location of the blaze. The Launch Complex 39 Area facilities that will be protected by the new, state-of-the-art alarm system are critical to the processing and launch of the Space Shuttle. [NASA/KSC Release No. 25-92, March 9, 1992.]

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ENDEAVOUR: ROLLOVER COMPLETED

Another milestone on the way to Endeavour's maiden STS 49 flight was achieved March 7 when the Orbiter was rolled over to the Vehicle Assembly Building from the OPF; transfer was complete at 8:29 a.m. Former astronaut Michael McCulley said, "This is a pretty magnificent moment. Not just for us here, but for all of the United States." McCulley is now Deputy Launch Site Director for Lockheed Space Operations Co. Some 1200 Shuttle workers and their families were on hand to see Endeavour emerge from its processing hangar and be towed to the VAB. On March 8, the vehicle elements were mated and connections between the Orbiter and the external tank continue to be made. Endeavour will undergo its Shuttle Interface Test on March 10 and rollout to Launch Complex 39B is scheduled for early March 13. [Halvorson, FLORIDA TODAY, p. 2A, March 7, 1992; KSC SHUTTLE STATUS REPORT, 11 a.m., March 9, 1992; Halvorson, FLORIDA TODAY, p. 1A-2A, March 8, 1992.]

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COLUMBIA: TESTING UNDERWAY

In preparation for its STS 50 mission, Columbia is undergoing a variety of tests this week: leak and functional tests of the APUs; tests of the electrical system and of the power reactant storage and distribution system. Preparations are also underway to install the EDO in the Orbiter this week. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 9, 1992.]

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DISCOVERY: RESIDUAL PROPELLANTS OFFLOADED

Residual hypergolic propellants have been offloaded from Discovery this weekend. Deservicing of freon coolant loop No. 2 and extensive midbody structural inspections are in progress this week. Later this week, the three main engines will be removed from the Orbiter along with the removal of both orbital maneuvering system pods. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 9, 1992.]

March 10:

STS 45 LAUNCH: MARCH 23

NASA managers today set March 23, 1992, as the official launch date for the next Shuttle mission, STS 45, which will involve the Shuttle Atlantis carrying the Atmospheric Laboratory for Applications and Science (ATLAS-1) payload. During the 8 day mission, Atlantis' crew will study the chemistry of Earth's atmosphere, solar radiation, space plasma physics and ultraviolet astronomy. The launch window on March 23 opens at 8:01 a.m. EST and extends for 2 1/2 hours. Landing would normally take place at 6:08 a.m. EST, March 31 at the Kennedy Space Center, FL, weather permitting. Commanding Atlantis will be Charles F. Bolden, making his third space flight. Brian Duffy will serve as pilot, making his first Shuttle flight. Mission Specialists include Kathryn D. Sullivan, making her third flight; David C. Leestma, making his third flight; and Michael C. Foale, making his first flight. Payload Specialists will be Byron Lichtenberg, making his second flight and Dirk Frimout, a Belgian scientist, making his first flight. [NASA/KSC News Release: "Launch Advisory: Shuttle Mission STS-45 Set for Launch March 23," March 10, 1992.]

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STS 45: FLIGHT READINESS TEST

While the STS 45 Flight Readiness Review is underway at Kennedy Space Center, the main engines of the Space Shuttle Atlantis are undergoing a Flight Readiness Test; the engines' valves are being cycled and sensors are being calibrated. Technicians at Launch Complex 39A have completely purged the 17-inch umbilical cavity between the external tank and the Orbiter; they have drained the auxiliary power unit catch bottles and mated the Orbiter midbody umbilical unit to the Orbiter. Scheduled work: ordnance operations this week; start of aft closeouts; installation of the two contingency space suits on March 13. KSC spokeswoman Lisa Malone said, "We feel good about the schedule and we're looking forward to launch." KSC SHUTTLE STATUS REPORT, 11 a.m., March 10, 1992; Banke, FLORIDA TODAY, p. 2A, March 10, 1992; Banke, FLORIDA TODAY, p. 6A, March 11, 1992.]

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ENDEAVOUR: STS 49 VAB PROCESSING

Technicians in the Vehicle Assembly Building have completed the mechanical and electrical connections between Endeavour and its solid rocket boosters and external tank. Preparations have begun for Endeavour's Shuttle Interface Test and for attaching thermal protection material to the main engine nozzles. Rollout to Launch Complex 39B is slated for early March 13. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 10, 1992.]

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TESTS BEGUN ON COLUMBIA

Work in progress upon Columbia includes: leak and functional tests of the auxiliary power units and the power reactant storage and distribution system; calibrations of the inertial measurement units; preparations to install the Extended Duration Orbiter (EDO) pallet; installation will occur later this week. Columbia's next mission will be STS 50. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 10, 1992.]

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DISCOVERY: INSPECTIONS UNDERWAY

The Space Shuttle Discovery's next mission will be STS 53, but before that occurs the Orbiter is undergoing extensive modifications of the sort made upon Columbia last year. Currently, technicians in OPF Bay 2 are deservicing freon coolant loop No. 2 and making extensive structural inspections in the midbody of the vehicle. Work scheduled: removal of the three main engines and orbital maneuvering system pods this week. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 10, 1992.]

March 11:

DAN GOLDIN TO HEAD NASA

TRW Vice President and General Manager Daniel S. Goldin was nominated to succeed Richard H. Truly as NASA Administrator today by President Bush during a press conference. "Dan is a leader in America's aerospace industry and a man of extraordinary energy and vitality," the president said. "Working with the vice president as chairman of the Space Council, Dan Goldin will ensure America's leadership in space as we enter the 21st century." In the 1960s, Goldin began his space career as a research scientist at Lewis Research Center (Cleveland, OH). Other candidates for the top NASA job were Edward C. "Pete" Aldridge, former Air Force Secretary, James Abrahamson, former director of the Strategic Defense Initiative Organization and David Kearns, former chief executive officer of Xerox Corp. [Halvorson and Banke, FLORIDA TODAY, March 11,

1992; Halvorson and Banke, FLORIDA TODAY, pp. 1A-2A, March 12, 1992; Holton & Date, THE ORLANDO SENTINEL, pp. A-1 & A-8, March 12, 1992.]

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PREVIOUS NASA ADMINISTRATORS

ADMINISTRATOR	TENURE
T. Keith Glennan	1958-1961
James Webb	1961-1968
Thomas Paine	1969-1970
James Fletcher	1971-1977
Robert Frosch	1977-1981
James Beggs	1981-1985
James Fletcher	1986-1989
Richard H. Truly	1989-1992

[*Previous NASA Administrators,* THE ORLANDO SENTINEL, p. A-8, March 12, 1992.]

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TRULY'S REMARKS ON GOLDIN APPOINTMENT

NASA Administrator Richard H. Truly issued the following statement today concerning the nomination of Daniel S. Goldin to be NASA Administrator. "I am pleased to learn that President Bush intends to nominate Daniel S. Goldin as the next Administrator of NASA. Mr. Goldin has a long history of working in the space arena, in both NASA and DOD programs, and the NASA team stands ready to support him. The continued achievement's of NASA's space and aeronautics research programs are vitally important to the nation, and Mr. Goldin will be arriving at a time of great challenges and opportunities for the future. I wish him every success as he comes to this elite organization." [Truly Statement on Goldin Appointment, March 11, 1992.]

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CRIPPEN: GOLDEN APPOINTMENT

Statement from KSC Director Robert L. Crippen on the appointment of Daniel S. Goldin: "I was delighted to learn the President has nominated a new NASA Administrator. While I do not know Daniel Goldin personally, I am sure the President, who has made a strong commitment to the nation's space program, has nominated someone he is confident can lead NASA through the very challenging and exciting years ahead of us. The challenging and exciting years we are facing are also critical years for NASA, and I look forward to working closely with the new administrator." [Crippen Statement on Goldin Appointment, March 11, 1992.]

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BEACH CLOSURE: ENDEAVOUR ROLLOUT

Playalinda Beach will be closed to visitors as of Friday (March 13, 1992) as NASA prepares for the launch of the Space Shuttle Endeavour on mission STS 49. The beach closing is required because of the move of the Orbiter from the Vehicle Assembly Building

to Launch Complex 39B. Rollout is scheduled to begin at 8:00 a.m. Launch is currently targeted for the first week of May. The southern part of the Canaveral National Seashore will remain closed until the morning after launch, reopening at normal hours at launch plus one day. [NASA/KSC Release No. 28-92, March 11, 1992.]

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STS 45: FRR COMPLETED

The Flight Readiness Review for STS 45 has been completed at Kennedy Space Center and NASA managers have set March 23 as the launch date for Atlantis' next mission. A Flight Readiness Test has also been completed. Work in progress: closing the launch pad for ordnance operations today. Work scheduled: start of the aft closeouts and installation of the two contingency space suits on March 13. [KSC SHUTTLE STATUS REPORT, 11 a. m., March 11, 1992; Date, THE ORLANDO SENTINEL, March 11, 1992.]

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STS 49: SHUTTLE INTERFACE TEST COMPLETED

In VAB Bay 1, workers have completed Endeavour's Shuttle Interface Test in preparation for the planned rollout of the newest Orbiter to Launch Complex 39B at 8 a.m., March 13. A global profile test of the orbital maneuvering system engines has also been completed. Work in progress: preparations for rollout; attaching thermal protection material to the main engine nozzles; leak test of the liquid oxygen umbilical between the external tank and the Orbiter. [KSC SHUTTLE STATUS REPORT, 11 a. m., March 11, 1992.]

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COLUMBIA: MAIN PROPULSION TESTS

In OPF Bay 3 work in progress includes: tests of the main propulsion system; leak and functional tests of the auxiliary power units; tests of the power reactant storage and distribution system; preparations to install the Extended Duration Orbiter (EDO) pallet; installation of the Ku-band antenna drive assembly; preparations to install the three main engines. [KSC SHUTTLE STATUS REPORT, 11 a. m., March 11, 1992.]

March 12:

STS 45 UPDATE

Ordnance installation operations upon Atlantis have been completed at Launch Complex 39A as have main engine valve cycles and leak checks. Work in progress: auxiliary power unit catch bottle draining; preparations for Orbiter aft closeouts; power up ordnance checks. Contingency space suit installation is scheduled for March 13. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 12, 1992.]

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ENDEAVOUR: LEAK CHECK COMPLETED

In preparation for its imminent rollout for its STS 49 mission, Endeavour has had a 400 psi leak check on its gaseous oxygen lines performed. Work in progress: vehicle rollout preparations; Orbiter and external tank closeouts; insulation of fuel lines; Orbiter and external tank cavity purges. Work scheduled: closing of aft compartment tonight; retraction of work platforms from around vehicle in VAB; rollout of Endeavour to Launch Complex 39B set to begin at 8:00 a.m. March 13. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 12, 1992.]

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STS 50 PROCESSING: COLUMBIA

Work in progress includes: main propulsion system tests; auxiliary power unit leak and functional tests; Ku-Band wire harness installation; preparations for installation of Extended Duration Orbiter (EDO) pallet; star tracker door installation. The EDO pallet's installation is scheduled for March 13. In OPF Bay 2, the main engines and orbital maneuvering system pods will be removed from Discovery tomorrow. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 12, 1992.]

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ATLAS READY, AGAIN

The much delayed Atlas launch with its Galaxy 5 communications satellite payload is scheduled to lift off tonight during one of three launch windows [SEE ABOVE]. "This satellite will be the satellite most people in America will get cable television from for the next 12 years," said Jerry Farrell, vice president of Hughes Communications, Inc., manufacturer and owner of the satellite. It will replace the cable satellite known as Westar 5. Tonight will mark the sixth time the rocket has been readied for launch. [Banke, FLORIDA TODAY, p. 8A, March 12, 1992.]

March 13:

SPACESUITS INSTALLED IN ATLANTIS

"This is going to be a big week. We're going to be getting ready for our second mission of the year," said Kennedy Space Center spokesman Bruce Buckingham. Contingency spacesuits have been installed in the midbody of Atlantis and the first part of ordnance operations have been completed at Launch Complex 39A. Work in progress: tests of the systems supporting the two spacesuits; purges of the external tank; closing out of the aft compartment. Work scheduled: closing out the aft compartment next week; launch countdown starts March 20 at the T-43 hour mark and the STS 45 flight crew arrives the same day. Buckingham said the astronauts will spend the days before launch attending briefings, flying, checking their flight suits for fit and undergoing final physical examinations. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 13, 1992; Halvorson, FLORIDA TODAY, p. 7A, March 15, 1992.]

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ENDEAVOUR: STS 49 PREPARATIONS

"All this whining about Americans don't do good work is B. S.," said John "Tip" Talone, Jr., Manager of Endeavour Processing. "I know better. Americans, when they're given a challenge, do damn good work, really good work, extraordinary work that a lot of people in the world don't even care to try to do." Endeavour began its first rollout ever this morning at 7:18 a.m.; it was expected to be hard down at the pad by 2:00 p.m. Once at the pad, technicians began to make connections between the launch pad and the Orbiter elements. There is an engine flight readiness test on March 22. Two auxiliary power units will be replaced next week. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 13, 1992; Banke, FLORIDA TODAY, p. 1A, March 14, 1992; Banke, FLORIDA TODAY, p. 9E, March 15, 1992; Halvorson and Banke, FLORIDA TODAY, p. 9A, March 13, 1992.]

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STS-50: KU-BAND ANTENNA INSTALLED

The Ku-Band antenna drive assembly has been installed in Columbia as part of processing work for the oldest Shuttle's STS 50 mission. Work in progress: tests of the main propulsion system; leak and functional tests of the auxiliary power units; tests of the power reactant storage and distribution system; preparations to install the Extended

Duration Orbiter (EDO) pallet. Columbia's three main engines will be installed next week. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 13, 1992.]

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DISCOVERY: MODIFICATION PERIOD TO START

In OPF Bay 2, technicians have completed the final power down of Discovery for its modification period; the right orbital maneuvering system pod was removed yesterday; the No. 2 main engine has been removed; the freon coolant loop No. 2 was deserviced. Work in progress: removal of the main engines and extensive structural inspections. The left orbital maneuvering system pod will be removed next week. [KSC SHUTTLE STATUS REPORT, 11 a.m., March 13, 1992.]

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ATLAS FINALLY LAUNCHES

"The launch of Galaxy 5 represents a very significant era in cable television distribution," said Jerry Farrell, Hughes Communications, Inc. "Galaxy 5 will be the premiere cable satellite for the next decade." Farrell spoke just after the launch of Atlas 1 (built by General Dynamics Corp.) at 7 p.m. tonight. General Dynamics plans to launch 23 more rockets over the next seven years; three Atlas launches are scheduled for this year. [Halvorson, FLORIDA TODAY, p. 6A, March 14, 1992.]

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NEWMAN GIVES SNOOPY AWARDS

Astronaut James H. Newman has recently awarded Silver Snoopy Awards to Christopher Gariepy, (Lockheed Space Operations Co.); John Proferes, John Ghanele and Herbert Muchow, all employees of USBI. "Those of us who are astronauts thank you for the continued and outstanding support you have given us through your work," Newman said. ["Astronaut Doles Out Silver Snoopy Awards," FLORIDA TODAY, p. 9E, March 15, 1992.]

March 16:

STS 45: ATLANTIS TANK PURGED

At Launch Complex 39A, the external tank of Atlantis has been purged in preparation for launch targeted for March 23. Work in progress: closing out the aft compartment; launch countdown preparations; topping off the ATLAS payload with freon. On March 20, the crew arrives and the launch countdown begins at noon at T-43 hour mark. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 16, 1992.]

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ENDEAVOUR: APUS REPLACED

At Launch Complex 39B, Endeavour has had both its APUs replaced; the pad hook-ups have also been completed. Work in progress: cleaning of the payload bay; preparations for the flight readiness firing; preparations for the helium signature leak test of the main engines and main propulsion system. Work scheduled: an end-to-end test of the solid rocket boosters March 25 and an engine flight readiness test on March 26. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 16, 1992.]

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COLUMBIA: SYSTEMS INSTALLED

In the early stages of processing for STS 50, the next mission of Columbia, technicians have installed main propulsion system regulators and helium tanks. Work in progress: installation of the three main engines and the Extended Duration Orbiter (EDO) pallet. Tests of the Ku-Band antenna are scheduled. The main engines have been removed

from the Space Shuttle Discovery which is beginning a period of extensive modifications in OPF Bay 2 before undertaking its STS 53 mission. Work in progress includes: extensive structural inspections; preparations to remove the left orbital maneuvering system pod; deservicing the freon coolant loop No. 1 and inspection of the radiators. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 16, 1992.]

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SR 3 WIDENING TO CONTINUE

Brevard County officials said today that the widening of State Road 3 will resume soon. The widening was stalled when the county began the project before obtaining all of the needed right of way. Kennedy Space Center completed its portion of the widening project - two and a half miles - last August. Henry Minneboo, Director of the county's Road and Bridge Division, said the county's portion should be finished by February 1993, more than a year after the original completion target. [Reitz, FLORIDA TODAY, p. 1A, March 16, 1992.]

March 17:

STS 45: ATLAS PAYLOAD TOPPED OFF

At Launch Complex 39A, technicians have topped off the ATLAS payload with freon as Atlantis waits a final week before launching STS 45 on March 23. "We're moving ahead, right on schedule," said Kennedy Space Center spokesman Bruce Buckingham. Work in progress includes: closing the payload bay doors for flight; closing out the aft compartment including final inspections, removing platforms and installing the doors for flight; launch countdown preparations; final ordnance operations tonight; stowing crew equipment in the crew cabin. The hypergolic propellant tanks will be pressurized overnight and the countdown begins March 20 at noon. The flight crew is expected to arrive at 6:30 p.m., also March 20. Liftoff is scheduled for 8:01 a.m. EST, Monday, March 23. The STS 45 crew includes Commander Charles F. Bolden, Pilot Brian Duffy, Mission Specialists Kathryn D. Sullivan, David C. Leestma and Michael C. Foale and Payload Specialists Byron Lichtenberg and Dirk Frimout. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 17, 1992; "Launch of Atlantis Still On Schedule At Launch Pad 39A," FLORIDA TODAY, p. 6A, March 18, 1992, (Banke, FLORIDA TODAY, p. 2A, March 17, 1992.)]

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STS 49: CREW CABIN PREPARATIONS

The Space Shuttle Endeavour, currently at Launch Complex 39B, continues to undergo preparations for its maiden flight, STS 49. The newest Shuttle's payload bay is being cleaned and prepared for the upcoming flight readiness firing on March 26. A helium signature leak test of the main engines and main propulsion system has begun and the crew cabin is being readied for flight. An end-to-end test of Endeavour's solid rocket boosters is scheduled for this week. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 17, 1992.]

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COLUMBIA: OPF BAY 3

In OPF Bay 3, main engines No. 1 and 2 have been installed in Columbia and the EDO pallet was installed yesterday. Work scheduled: installing the No. 3 main engine; hooking up the Extended Duration Orbiter (EDO) pallet; tests of the Ku-band antenna. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 17, 1992.]

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DISCOVERY'S MODIFICATIONS

Discovery is undergoing extensive structural inspections and the left orbital maneuvering system pod. Freon coolant loop No. 1 is being deserviced and the radiators are being inspected. Discovery's next mission will be STS 53. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 17, 1992.]

March 18:

FIRST 1992 CELSS CROP

NASA scientists today prepared to harvest nearly 350 pounds of potatoes grown without soil inside a computer-controlled biomass chamber on the Cape Canaveral Air Force Station. Today's harvest concluded a 90-day growth cycle for the second group of potatoes to be grown inside the bubble-shaped biosphere of the Closed Ecological Life Support System (CELSS). "The yield was significantly better than our preliminary studies," remarked NASA research plant physiologist Dr. **Raymond Wheeler**. "We're very pleased with the results of this potato crop and the continued performance of the CELSS chamber." The potato harvest was the eleventh in the history of KSC's CELSS research program. Lettuce, soybeans and wheat are other plants previously harvested from the CELSS chamber, which was constructed from test hardware used in the Mercury and Gemini programs. Using a specially developed environment controlled by computers, NASA scientists are learning how to deliver nutrients, monitor growth and gaseous outputs and produce healthy plants with a minimum amount of human intervention. CELSS is a futuristic program being developed for a time when astronauts will need to grow much of their own foods in space. The program will prove imperative and invaluable for future long-duration space missions and ventures into planetary habitats. The goals of CELSS researchers are to learn how to use a controlled environment to grow food, generate oxygen and recycle waste products to fertilize the plants. [NASA/KSC News Release No. 33-92, March 18, 1992.]

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STS 45: LC 39A PROCESSING

Technicians at Launch Complex 39A have closed the payload bay doors of Atlantis for flight; they pressurized the hypergolic propellant tanks and completed final ordnance operations. Work in progress: closing out the aft compartment including removing platforms and installing the doors for flight; launch countdown preparations; stowing crew equipment in the crew cabin; moving booster flame deflectors to the launch position; installation of the crew escape pole; removing service platforms from the mobile launcher platform. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 18, 1992.]

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ENDEAVOUR: STS 49 PREPARATIONS

At Launch Complex 39B technicians have completed a helium signature leak test of Endeavour's main engines and main propulsion system. Work in progress: end-to-end testing of the solid rocket boosters; cleaning of the payload bay; installing instrumentation for the flight readiness firing which is scheduled for March 19; work to ready the crew cabin for flight. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 18, 1992.]

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COLUMBIA: MAIN ENGINES INSTALLED

Columbia's new main engines have been installed in preparation for its STS 50 flight. Work in progress: check out of the Extended Duration Orbiter (EDO) pallet; tests of the

Ku-band antenna and of the engines and main propulsion system. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 18, 1992.]

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DISCOVERY IN OPF BAY 2

In Orbiter Processing Bay 2, workers have removed Discovery's left orbital maneuvering system pod and have deserviced freon coolant loop No. 1. Currently, the technicians are making extensive structural inspections, inspecting the radiators and making modifications to the Orbiter like those made previously to the Space Shuttle Columbia in Palmdale, CA. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 18, 1992.]

March 19:

STS 45 FORECAST: 40% FAVORABLE

There is a 40 percent chance of having acceptable weather conditions at the opening of the launch window and a 50 percent chance for the entire launch period. Technicians at Launch Complex 39A have closed out the aft compartment (completed March 18); moved booster flame deflectors to the launch position; installed the crew escape pole and removed service platforms from the mobile launcher platform. Work in progress: launch countdown preparations; stowing crew equipment in the crew cabin; removing platforms from the flight deck; washing down the mobile launcher platforms and the flame trench; installing and filling the sound suppression water system bags. Six and one half hours after the launch countdown begins at noon on March 23, the STS 45 crew is expected to arrive at Kennedy Space Center. Launch is targeted for 8:01 a.m. EST on March 23. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 19, 1992; "Shuttle Atlantis On Schedule," FLORIDA TODAY, p. 8A, March 19, 1992.]

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STS 49: END-TO-END TEST COMPLETED

Technicians have completed an end-to-end test of Endeavour's solid rocket boosters. STS 49 work in progress: flight readiness test of the main engines; preparations to load hypergolic propellants into the Orbiter; frequency response test of the solid rocket boosters hydraulically operated systems; cleaning of the payload bay; installing instrumentation for the flight readiness firing; work to ready the crew cabin for flight. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 19, 1992.]

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STS 50: COLUMBIA PROCESSING

Work in progress on Columbia in OPF Bay 3 includes: check out of the Extended Duration Orbiter (EDO) pallet; tests of the Ku-band antenna and the engines and main propulsion system; electrical connections of the main engines and a single cell voltage test of the fuel cells. Meanwhile, Discovery is in OPF Bay 2 where technicians are drying the water loops; making leak checks of the main propulsion system; undertaking extensive structural inspections of the Orbiter and its radiators and beginning Orbiter modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 19, 1992.]

March 20:

STS 45: SRBS CLOSED OUT

At Launch Complex 39A, Atlantis awaits launch on its STS 45 mission. Pad technicians have closed out the Orbiter's solid rocket boosters, the external tank intertank, the auxiliary power units and ordnance devices for flight. Work in progress: launch countdown preparations and stowage of crew equipment in the crew cabin. Work scheduled: crew arrival; loading liquid oxygen and liquid hydrogen reactants into the

Orbiter's onboard storage tanks on March 21; moving the rotating service structure to the launch position by noon March 22; begin loading the external tank with its flight load of cryogenic propellants starting at 11:41 p.m. March 22. The countdown to launch begins at noon today. Launch remains targeted for 8:01 a.m., March 23. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 20, 1992; Halvorson, FLORIDA TODAY, p. 1A, March 20, 1992.]

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ENDEAVOUR: FRR COMPLETED FOR STS 49

The Space Shuttle Endeavour has undergone two milestone tests in preparation for its maiden flight in early May of this year. A flight readiness test of the Orbiter's main engines has been completed as has a frequency response test of the solid rocket boosters hydraulically operated systems. Technicians are now preparing to load hypergolic propellants into the Orbiter; they are also cleaning the payload bay, installing instrumentation for the flight readiness firing, readying the crew cabin for flight and conducting leak checks of the APUs. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 20, 1992.]

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COLUMBIA: EDO PALLET CHECK-OUT

In OPF Bay 3, the Extended Duration Orbiter (EDO) pallet is being checked out. In addition tests of the Ku-band antenna, the main engines and the main propulsion system are underway. The Orbiter's fuel cells are undergoing a single cell voltage test. The Orbiter midbody is being closed out. In OPF Bay 2, Discovery is being modified before its STS 53 mission. Technicians are drying the water loops, conducting leak checks of the main propulsion system, making extensive structural inspections, and removing the vehicle's radiators. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 20, 1992.]

March 22:

WEATHER TO DETERMINE LIFTOFF

Al Solga, a KSC launch official, said today that "weather is the only cloud over the countdown" of STS 45. NASA Test Director Eric F. Redding said, "We're not looking at any technical problems." Weather concerns have reduced the likelihood of favorable weather to 20% at the opening of the launch window at 8:01 a.m. March 23. Capt. Mike Adams (45th Weather Squadron) said, "We have a whole score of weather concerns." These include: showers or thunderstorms; gusty crosswinds; layers of clouds more than 4,500 feet thick which might generate lightning and cloud decks too close to the ground. Tanking operations will proceed as usual. Launch Director Robert B. Sieck said, "We just want to be prepared, if the opportunity presents itself, to be ready to go. You never know with the weather. It doesn't have to be perfect; it just has to be good enough." The STS 45 crew includes Commander Charles F. Bolden, Pilot Brian Duffy, Mission Specialists Kathryn D. Sullivan, David C. Leestma and Michael C. Foale and Payload Specialists Byron Lichtenberg and Dirk Frimout. Lichtenberg said, "This is the first Space Shuttle mission dedicated to Earth observations, to looking at our environment, to understanding the atmosphere. So for all the taxpayers out there, this ATLAS is for you." [Banke, FLORIDA TODAY, p. 3A, March 23, 1992; Halvorson, FLORIDA TODAY, p. 5A, March 21, 1992.]

March 23:

STS 45 LAUNCH SCRUBBED

When engineers detected leaks of oxygen and hydrogen from the rear engine compartment of Atlantis they scrubbed today's launch of the STS 45 mission. The leaks

were traced to seals in two 17-inch-wide pipelines funneling fuel for the external tank to the Orbiter's three main engines. Launch Director Robert B. Sieck said that the super cold propellants had caused the seals to contract and leak. Tests showed after the scrub that the leaks disappeared once temperatures stabilized during fueling operations, he said. The launch was rescheduled for 8:00 a.m. March 24. Sieck said, "I think the opportunity is good that we'll go fly." [Halvorson, FLORIDA TODAY, pp. 1A-2A, March 24, 1992.]

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STS 45 RESCHEDULED

A decision has been made by NASA managers to make a second launch attempt of the Space Shuttle on March 24; the seven crew members had not yet boarded Atlantis. The countdown clock has been recycled to the T-11 hour mark and will resume counting at 6:40 p.m. Tanking of the vehicle will begin at 11:10 p.m. leading to a liftoff at exactly 8:00 a.m. Tuesday (March 24). There is a 70% chance of acceptable weather at the opening of the launch window, and an 80 % overall. Propulsion system engineers believe that the temporary liquid hydrogen and liquid oxygen leakage which was observed is the result of a seal between the external tank and the Orbiter which was not completely thermally conditioned. No leaks were observed outside the vehicle. Launch Director Robert B. Sieck was confident that the trouble was not a recurrence of the hydrogen leaks which grounded the fleet for almost half the year in 1990. He said that, in the past, metal components had been slow to adapt to the extremely cold temperature of the liquid fuel. Looking farther at the weather at 8:00 a.m. tomorrow at the opening of the window....the temperature is forecast to be 60 degrees, with a humidity of 83%, winds will be NNE at 10 knots with occasional gusts to 20 knots. There will be scattered to broken stratocumulus clouds from 4,000 to 6,000 feet. There is a slight chance of an isolated shower, an occasional cloud ceiling below 8,000 feet, or of a cross wind violation. Overall, the weather is rated as 70% favorable for launch March 24. The launch window on March 24 extends from 8 a.m. to 10:30 a.m. EST. [KSC Status Report, 10:15 a.m., March 23, 1992; see story below; "Fuel Leaks Ground Shuttle, Launch Is Reset for Today," THE WASHINGTON POST, March 24, 1992; "Shuttle Launch Pushed Back to Today Because of Fuel Leaks," THE WASHINGTON TIMES, March 24, 1992; Wilford, THE NEW YORK TIMES, March 24, 1992; Dunn, THE PHILADELPHIA INQUIRER, March 24, 1992.]

March 24:

STS 45 LAUNCH SUCCESS: LITTLE PAD DAMAGE

Atlantis was launched from Launch Complex 39A at 8:13:40:0481 a.m. EST this morning after a brief delay called by flight controllers for the weather to clear at the Shuttle Landing Facility. Launch Commentator George Diller said, "The weather is always the wild card in any launch attempt. Obviously," he said, "if the crew has to turn around and come back (to KSC's Shuttle Landing Facility), they have to have a straight line of sight to the runway below 8,000 feet." Outgoing NASA Administrator Richard H. Truly said, "It was a beautiful sight. This is the 21st Shuttle flight in 42 months and that's quite a record. I think things are really on the move for the space program." A leak like the one which led to Monday's scrub of the mission recurred early in the tanking operation for Tuesday's liftoff, but it subsided to safe levels during the three-hour fueling operation. Mission Operations Director Lee Briscoe said, "The whole flight is going very well, with no problems to speak of." Minimal damage was reported at the launch pad. The solid rocket booster retrieval ships are towing the two STS 45 boosters. The Freedom Star is expected to be at the port at 4 p.m. and the Liberty Star is estimated to be at the port by 10 p.m. The Freedom is estimated to arrive at Hangar AF at 6:30 p.m. tonight and the

Liberty will probably remain at the port overnight and go up the Banana River to Hangar AF tomorrow. Atlantis' landing is planned on April 1 at 6:19 a.m. EST at KSC's Shuttle Landing Facility. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 25, 1992; Halvorson and Banke, FLORIDA TODAY, pp. 1A-2A, March 25, 1992; Wilford, THE NEW YORK TIMES, p. A9, March 25, 1992.]

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ENDEAVOUR: STS 49 PROCESSING

At Launch Complex 39B, pad technicians continue to ready the Space Shuttle Endeavour for its May STS 49 mission. Work in progress: preparations to load hypergolic propellants into the orbiter; clearing the pad at 4 p.m. today; closure of the payload bay doors; installing instrumentation for the flight readiness firing; work to ready the crew cabin for flight; leak checks of the auxiliary power units. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 25, 1992.]

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COLUMBIA: STS 50 PREPARATIONS

In Orbiter Processing Facility Bay 3 technicians are checking out the Extended Duration Orbiter (EDO) pallet in Columbia's cargo bay. Other work in progress includes: tests of the power reactant storage and distribution system; leak checks of the environmental control system fluid lines; close outs of the midbody. Work scheduled: tests of the main propulsion system helium regulators and installation of the forward reaction control system on March 28. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 25, 1992.]

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DISCOVERY: OFF BAY 2

Leak checks are being performed on Discovery's main propulsion system while it is in Orbiter Processing Facility Bay 2 undergoing major modifications. There are also extensive inspections being conducted as well as modifications for the drag chute. Both freon lines of the Orbiter have been deserviced. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 25, 1992.]

March 26:

TEACHER MORGAN MAY FLY

NASA Administrator Richard H. Truly said today that he supports using space to enhance education and that he will recommend to his successor, Daniel S. Goldin, that NASA fly Barbara Morgan as a teacher in space. Morgan was backup to the late Christa McAuliffe who was killed in the Challenger accident in January 1986. The following text is an excerpt from remarks Truly made while presenting NASA's Brewer Trophy: 'As you know, I'll be leaving NASA very soon but, there is one more thing we need, I believe, to inspire our young people. The time has come to begin a formal program of teaching from space. We use the medium of space to enhance education in many areas. The next step for us will be to make routine a program of teaching from space by astronauts in space to take advantage of the weightless environment, the explanation of experiments that are on board the Space Shuttle and the view of Earth, the solar system, and the universe that the Space Shuttle provides. Later, we will continue the teaching from Space Station Freedom and I predict from the surface of the Moon and Mars.

'Earlier I pointed out that our astronauts have already proven their abilities as teachers. But to state the "Teaching From Space" Program in the most positive way, it is time that NASA kick off this endeavour by flying Barbara Morgan....Christa McAuliffe was one of the most inspiring people I have ever met. She was a hard working, devoted and created

teacher who understood how young people are attracted to the wonders of space exploration, just as she was. When given the opportunity to participate in this great adventure to help encourage America's young people to do better, she seized it; but fate intervened. Barbara Morgan is another great teacher. I talked with Barbara last night. She's participating in the National Science Teacher's Association Convention. She still is an elementary school teacher in McCall, Idaho. She's ready, the Space Shuttle is ready, and the American people are ready [for] the educational inspiration that flying Barbara will provide.

"We now have a substantial amount of experience with our new Space Shuttle program. I can tell you today that we have the highest confidence in it and the system we have designed to operate it. NASA senior management has reviewed this situation annually, and I am more than satisfied; I am eager. But for this opportunity to succeed, it must have the full support of the new NASA Administrator. Accordingly, I am making a recommendation to Dan Goldin that, once aboard and quickly, he take his own look and that he invite Barbara to join the crew of some appropriate mission. I have every confidence that this will happen soon." The Administrator made these remarks while presenting the National Aeronautics Association's Frank G. Brewer Trophy at the National Congress on Aviation and Space Education (Oklahoma City, OK). The trophy is the nation's highest award for contributions to aviation and space education. This year's recipient is Lt. Gen. Kenneth L. Tallman (USAF Ret.) [NASA/KSC News Release No. 92-40, March 26, 1992.]

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RETRIEVAL SHIPS ARRIVE AT HANGAR AF

Both solid rocket booster retrieval ships have arrived at Hangar AF at the Cape Canaveral Air Force Station. The Freedom Star arrived at the dock with the left booster at 6:30 p.m. last night. The Liberty Star spent the night at Port Canaveral and made its way up the Banana River this morning and arrived at Hangar AF with the right booster at 8 a.m. today. The left booster is on its dolly for post-flight safety and inspections. Technicians are hoisting the right booster onto its dolly today. Atlantis is scheduled to land at the Shuttle Landing Facility at 6:19 a.m. EST. [KSC SHUTTLE STATUS REPORT, 10 a. m., March 26, 1992.]

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ENDEAVOUR: PROPELLANT LOADING

Endeavour's payload bay doors and leak checks of the Orbiter's auxiliary power units have been completed at Launch Complex 39B in preparation for the STS 49 mission. Work in progress: loading hypergolic propellants into the Orbiter. Hypergolic fuel and oxidizer propellants are being loaded into the Orbiter's storage tanks for the orbital maneuvering system engines and the reaction control system thrusters. In addition, hydrazine will be loaded onboard for the Orbiter's auxiliary power units and the boosters' hydraulic power units. The launch pad is closed to all non-essential personnel during this operation. The installation of instrumentation for the Flight Readiness Firing has been scheduled. [KSC SHUTTLE STATUS REPORT, 10 a. m., March 26, 1992.]

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COLUMBIA: EDO CHECKOUT

The Space Shuttle Columbia is in Orbiter Processing Facility 3 where it is undergoing preparations for its STS 50 mission. Work in progress: check out of the Extended Duration Orbiter (EDO) pallet; tests of the power reactant storage and distribution system; leak checks of environmental control system fluid lines; close outs of the midbody; tests

of the interfaces between the main engines and the main propulsion system; tests of the communications systems; installing thermal control blankets into the forward reaction control system cavity. Work scheduled: tests of the main propulsion system helium regulators and installation of the forward reaction control system March 28. Discovery is in OPF Bay 2 for extensive modifications; the work in progress: leak checks of the main propulsion system; extensive structural inspections taking X-rays and modifications of the Orbiter's drag chute. [KSC SHUTTLE STATUS REPORT, 10 a. m., March 26, 1992.]

March 27:

ATLANTIS: SRB PROCESSING

At Kennedy Space Center, the thrust vector control systems on both of Atlantis' solid rocket boosters have been depressurized and hydrolasing operations are underway on the tunnel covers to remove the close out material. The STS 45 mission of Atlantis is scheduled to conclude with a landing at KSC's Shuttle Landing Facility at 6:19 a.m. EST on April 1. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 27, 1992.]

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ENDEAVOUR: STS 49 PAD PREPARATIONS

In preparation for Endeavour's STS 49 mission, nitrogen tetroxide has been loaded into the Orbiter's storage tanks for the orbital maneuvering system engines and the reaction control system thrusters. In addition, hydrazine will be loaded onboard for the Orbiter's auxiliary power units and the boosters' hydraulic power units. The launch pad will be closed to all nonessential personnel through tonight when this operation is complete. Work scheduled: installation of instrumentation for the Flight Readiness Firing is targeted for April 6 at 11 a.m. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 27, 1992.]

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COLUMBIA: TESTS AND CHECKOUTS

In preparation for Columbia's STS 50 mission, technicians in OPF Bay 3 are testing the main propulsion helium system regulators. Other work in progress includes: preparations to install the forward reaction control system; checkout of the Extended Duration Orbiter (EDO) pallet; installing heat shields around the main engines; leak checks of the environmental control system fluid lines; closeouts of the midbody; installing thermal control blankets into the forward reaction control system cavity. On March 28, the forward reaction control system will be installed. Discovery is undergoing leak checks of the main propulsion system; extensive structural inspections using X-rays; Orbiter modifications and drag chutes modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 27, 1992.]

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GOLDIN PLEDGES CONSULTATION WITH CONGRESS

"I will consult with you (the U. S. Congress) on a regular basis, and I will be in charge of NASA," said Daniel Goldin, President Bush's nominee to be Administrator of NASA. U. S. Senator Al Gore (D-TN) said, "I welcome the forcefulness of that statement. You know very well that NASA as an institution is now faced with the problem of the space council expanding its role from what some of us regard as a quite legitimate role in looking at policy. But interference in the management decisions of the NASA Administrator crosses the line." Goldin said he had discussed the issue with both President Bush and Vice President J. Danforth Quayle; he said, "I think both of them want me to be in charge." [Lunner, FLORIDA TODAY, p. 4A, March 28, 1992; Eisler, FLORIDA TODAY, April 1, 1992.]

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JAMES E. WEBB DIES

James E. Webb, NASA Administrator when Neil Armstrong stepped out onto the moon's surface, died at Georgetown Hospital in Washington, D.C. Webb's eight-year tenure as head of NASA culminated with the Apollo 11 landing. Julian Scheer, an aide to Webb said the Apollo Program "has been likened to the Manhattan Project as one of two greatest managerial efforts in modern government." ["Man Who Guided U.S. to Moon Dies at 85," FLORIDA TODAY, p. 1A, March 29, 1992; "NASA Pioneer Dies," USA TODAY, p. 3A, March 29, 1992; Lambert, THE NEW YORK TIMES, p. 19, March 29, 1992; "Former NASA Chief Webb Led Moon-Landing Project," THE ORLANDO SENTINEL, March 30, 1992.]

March 30:

HYDROLASING STS 45 BOOSTERS

Hydrolasing activities are continuing on both solid rocket boosters to remove the thermal protective foam. Atlantis' mission has been extended one day and the end-of-mission landing is now scheduled for April 2 at 6:24 a.m. EST at Kennedy Space Center's Shuttle Landing Facility. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 30, 1992.]

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ENDEAVOUR: HYPERGOLIC FUEL LOADED

At Launch Complex 39B, hypergolic fuel has been loaded into Endeavour's storage tanks for the orbital maneuvering system engines and the reaction control system thrusters. Additionally, hydrazine was loaded onboard for the Orbiter's auxiliary power units and the boosters' hydraulic power units. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 30, 1992.]

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COLUMBIA: HEAT SHIELDS INSTALLED

Columbia's heat shields have been installed around its three main engines and the main propulsion system helium regulators have been tested. Work in progress: check out of the Extended Duration Orbiter (EDO) pallet; leak checks of environmental control system fluid lines and close outs of the midbody. On April 1, Columbia's forward reaction control system will be installed. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 30, 1992.]

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DISCOVERY MODIFICATIONS

Leak checks of Discovery's main propulsion system are underway in OPF Bay 2; extensive structural inspections have begun using X-rays and the Orbiter's drag chute is being modified as one of many changes being made in the vehicle. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 30, 1992.]

March 31:

ENDEAVOUR: ENGINE INTERFACE RETESTED

At Launch Complex 39B, Endeavour's engine interface unit No. 1 has been retested. Work in progress: firing room simulation of the Flight Readiness Firing; installation of instrumentation for the FRF; close out of the avionics bay and the aft compartment; installation of thermal blankets for the water spray boilers. The FRF countdown begins April 3 leading to a 32-second burn at 11 a.m. on April 6. Meanwhile, hydrolasing activities - the removal of foam residues - are continuing on both of Atlantis' solid rocket boosters and KSC is awaiting the Orbiter's landing at 6:24 a.m. on April 2 at the Shuttle Landing Facility. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 31, 1992.]

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COLUMBIA: FRC INSTALLATION SCHEDULED

Technicians in OPF Bay 3 will install Columbia's forward reaction control (FRC) system tomorrow (April 1). Other processing work on the Orbiter: check out of the Extended Duration Orbiter (EDO) pallet; leak checks of the environmental control system fluid lines; installation of thermal blankets in the Orbiter's midbody. In OPF Bay 2, Discovery is undergoing extensive structural inspections using X-rays and this operation is 75% complete. Orbiter modifications, including to the vehicle's drag chute, are also underway. [KSC SHUTTLE STATUS REPORT, 10 a.m., March 31, 1992.]

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SPACEHAB DEDICATION CEREMONY SET/APRIL 3

Kennedy Space Center Director Robert L. Crippen, former Administrator James Beggs and astronaut G. David Low will be among the keynote speakers at a press briefing and dedication ceremony for the Spacehab Payload Processing Facility (SPPF) and first Spacehab module. The event will occur at the Port Canaveral facility on Friday, April 3 at 10:00 a.m. Spacehab, Inc. is a commercial space company that will lease environmentally controlled laboratory modules for flight aboard the Space Shuttle. Each Spacehab module adds 1,100 cubic feet of pressurized working area to the Space Shuttle. The reusable Spacehab is first scheduled to fly aboard STS 57, expected to launch in June 1993. The SPPF is a 37,000-square-foot facility that will be used to check out and integrate payloads for flight inside the Spacehab module; it includes a clean room, 11 integration and checkout areas and office space. Spacehab is the first habitable space structure ever developed and funded entirely by private industry; it was developed and produced by McDonnell Douglas Space Systems Company under contract from Spacehab, Inc. [NASA/KSC News Release No. 41-92, March 31, 1992.]

I

GOLDIN CONFIRMED TO HEAD NASA

Daniel S. Goldin was confirmed as Administrator of NASA by the U. S. Senate on a voice vote. Former Kennedy Space Center Director Forrest S. McCartney said, "I think that's great. He is well suited for the job and the nation is fortunate to have a man of that caliber leading the agency. I'm sure he will do an outstanding job." Goldin is expected to make his first appearance as Administrator tomorrow when Atlantis lands at KSC. Yesterday, William Lenoir, Director of Space Flight for NASA announced his resignation. [Eisler, FLORIDA TODAY, April 1, 1992; Holton, THE ORLANDO SENTINEL, pp. A-1 & A-7, March 31, 1992.]

APRIL

April 1:

ATLANTIS: ON ORBIT

Hydrolasing activities are continuing on both solid rocket boosters to remove the thermal protective foam. Meanwhile, Atlantis' end-of-mission landing is scheduled for Thursday (April 2) at Kennedy Space Center [see below]. Weather conditions are favorable, but there is a chance of ground fog. Once on the ground, the Shuttle processing team will safe the Orbiter and the flight crew will emerge from the crew cabin. Atlantis will be towed to the Orbiter Processing Facility Bay 1 about three hours after landing for post-flight inspections. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 1, 1992; Date, THE ORLANDO SENTINEL, P. A-3, March 30, 1992.]

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ENDEAVOUR: FRF SIMULATION COMPLETED

Firing Room simulation of the Flight Readiness Firing of Endeavour has been completed in the LCC at KSC. Thermal blankets for the water spray boilers have also been installed. Work in progress: purges of the external tank; installing thermal curtains in the right hand solid rocket booster aft skirt; installation of instrumentation for the FRF; closeouts of the avionics bays and the aft compartment; preparations to install the blast doors on the aft compartment; installation of thermal blankets in the aft compartment. The FRF is scheduled for April 6. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 1, 1992; NASA/KSC News Release No. 45-92, April 3, 1992.]

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COLUMBIA: FRC INSTALLED

In OPF Bay 3, Columbia's forward reaction control system has been installed. Work in progress: replacement of a leaking oxidizer tank on the Extended Duration Orbiter (EDO) pallet; leak checks of the environmental control system fluid lines; closeouts of the midbody; installing thermal blankets in the midbody. Meanwhile, in OPF Bay 2, Discovery continues to undergo extensive modifications like those Columbia had in 1991. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 1, 1992.]

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TOPPING OFF CEREMONY SET: SSPF

KSC engineering and Space Station Freedom team members will celebrate a milestone in the construction of the Space Station Processing Facility (SSPF) on April 3 when the final structural steel beam is hoisted atop the giant building. Movement of the beam and subsequent remarks from KSC officials are scheduled to begin at 2 p.m. The SSPF will be a KSC-operated facility occupied by about 1,000 NASA and contractor employees. The three-story SSPF will include communications and electrical control areas, laboratories, logistics staging areas, operational control rooms, office areas and a cafeteria. The SSPF is the biggest new construction effort undertaken at KSC since the Apollo era. Construction began in March 1991 and the building is scheduled to be ready for occupancy by August 1994. The building was designed by Jacobs Engineering Group, Inc. (Lakeland, FL) and is being constructed by Metric Constructors, Inc. (Tampa, FL). [NASA/KSC News Release No. 42-92, April 1, 1992.]

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SENATE CONFIRMS GOLDIN FOR NASA

The U.S. Senate, in a voice vote, confirmed Daniel S. Goldin to succeed Richard H. Truly as NASA's next Administrator. Former KSC Director Forrest S. McCartney said of the

confirmation: "I think that's great. He is well suited for the job and the nation is fortunate to have a man of that caliber leading the agency. I'm sure he will do an outstanding job." [Eisler, FLORIDA TODAY, p. 1A, April 1, 1992.]

April 2:

STS 45 LANDS AT KSC

Atlantis' end-of-mission landing occurred at 6:23 a.m. EST today on Runway 33 at the Kennedy Space Center Shuttle Landing Facility. The main gear touched down at 6:23 a.m., the nose gear touched down at 6:23:14 and the wheels stopped at 6:24:04 a.m. for a total mission elapsed time of 8 days, 22 hours and 9 minutes. The Orbiter rollout distance on the runway was about 9217 feet. The flight crew members departed in the afternoon from KSC to return to the Johnson Space Center (Houston, TX) for post-flight follow-up exams and other activities. KSC's processing team towed the Orbiter to the OPF by 1 p.m. Initial assessments of the vehicle indicates that the vehicle is in good shape. Overall, the tiles look good with the exception of a ding on the No. 10 reinforced carbon panel on the right hand wing. That panel will be replaced before the next flight. Ordnance devices will be safed tomorrow (April 3) and preparations are underway to install the payload bay door strongbacks. The doors are scheduled to be opened April 6 and the ATLAS payload is scheduled for removal April 7. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 3, 1992; Brown, FLORIDA TODAY, p. 1A, April 2, 1992; Halvorson, FLORIDA TODAY, pp. 1A-2A, April 3, 1992; "Shuttle Lands in Florida After 9-Day Mission," THE NEW YORK TIMES, p. A7, April 3, 1992.]

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GOLDIN VIEWS STS 45 LANDING

New NASA Administrator Daniel S. Goldin was on hand at Kennedy Space Center to witness the landing of Atlantis at the conclusion of its STS 45 mission. At his press conference, he spoke of NASA's mission for the future: "It's the objective of NASA to really put the details to that program [return to the moon and to Mars] so the American public understands it. I want to spend the time with NASA folks to see what we have to do as the precursor steps: How can we retire the risk by doing the right things before spending significant amounts of money. We can't have NASA trying to do too many things at once and not to be in step with the total budget situation in this country," he said. "We're going to have a national consensus on that program, and I'm committed to making it happen." [Brown, FLORIDA TODAY, p. 1A, April 3, 1992; Date, THE ORLANDO SENTINEL, p. A-3, April 3, 1992.]

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ENDEAVOUR: AFT CLOSED FOR TEST

Endeavour's aft compartment has been closed in preparation for the Flight Readiness Firing scheduled for 11 a.m., April 6. The countdown for the firing begins today at 2 p.m. EST at the T-43 hour mark. Technicians at Launch Complex 39B are setting up measuring devices on the tail service mast and conducting final walkdowns and inspections. Endeavour's fuel cell storage tanks will be loaded tomorrow (April 4) with cryogenic reactants. The rotating service structure will be moved back at 1 p.m., April 5 and tanking will begin at 3:40 a.m. April 6. Launch Director Robert B. Sieck said of the test, "An FRF is the most dynamic ground test that the KSC team performs. The team has been involved in intensive planning and work at the pad these past several weeks to get ready. We're looking forward to pulling this test off crisply."

The FRF will provide an opportunity to test critical elements of the Shuttle Endeavour as a fully integrated vehicle in the KSC launch environment. It will provide confidence in the

performance of the vehicle's systems. Test objectives include assessing the integrity and performance of the main propulsion system of the Orbiter, engines and the external tank. The compatibility and functional performance between the launch facility and Endeavour's umbilical interfaces will be verified. Engineers will establish leak values for Endeavour's main propulsion system. All Orbiters have a minimal amount of acceptable leakage. Actual performance will be assessed of all vehicle elements and supporting pad systems. The test will also demonstrate the capability of the avionics equipment to effectively monitor and control the active vehicle under dynamic pre-liftoff, vibro-acoustic conditions. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 3, 1992; NASA/KSC News Release No. 45-92, April 3, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, April 6, 1992; Halvorson, FLORIDA TODAY, p. 4A, April 4, 1992.]

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COLUMBIA: PALLET TANK REPLACED

A leaking oxidizer tank on the EDO pallet in Columbia has been replaced. In OPF Bay 3, technicians' work in progress includes: electrical connections of the newly installed oxidizer tank on the EDO; testing of the forward reaction control system; closing out of the midbody and installation of thermal blankets in the midbody. In OPF Bay 2, Discovery continues to undergo modifications to its drag chute and to the Orbiter itself. Inspection of the Orbiter using X-rays continues, as well. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 3, 1992.]

April 4:

EXTERNAL TANK FILLED

Technicians will load cold propellants into Endeavour's external tank today in preparation for its Flight Readiness Firing. The Rotating Service Structure will be moved back at 1:00 p.m. [Halvorson, FLORIDA TODAY, p. 4A, April 5, 1992.]

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KSC POTATOES HARVESTED

A second crop of potatoes has been harvested from inside a bubble-shaped biomass chamber at Kennedy Space Center called the Closed Ecological Life Support System (CELSS). The potatoes were grown without soil in a simulated space environment to aid astronauts who must raise their own food on long-duration space flights. ["Researchers Grow Space Spuds at KSC," FLORIDA TODAY, p. 10E, April 5, 1992.]

April 6:

STS 49: FRF COMPLETED

The Flight Readiness Firing occurred this morning at 11:12 a.m. EDT and lasted for 22 seconds. The initial evaluation indicated that the test went well; engineers are analyzing the data. "It's just a little bit of an unnatural act just keeping it tied down and making those engines run," said STS 49 Commander Daniel C. Brandenstein. "But we believe very strongly that (the readiness firing) is an essential part of getting the vehicle ready for the first time it flies." Brandenstein will command Endeavour's maiden mission next month. The test went so well, according to Shuttle Program Director Leonard S. Nicholson, that Endeavour's first launch could come on May 5 rather than May 7. Launch Director Robert B. Sieck said, "It's a good test to have behind us." Post FRF operations are continuing at Launch Complex 39B and a gaseous hydrogen injection test is underway in the Orbiter's aft compartment. Work scheduled: deconfiguration of the launch pad from the FRF mode; STS 49 payloads transfer to the launch pad during the weekend; post-FRF inspections of the main propulsion system and main engines; Terminal Countdown Demonstration Test with the flight crew is planned for April 17. [KSC

SHUTTLE STATUS REPORT, 2:30 p.m., April 6, 1992; "Shuttle Test," USA TODAY, p. 3A, April 6, 1992; Halvorson, FLORIDA TODAY, p. 2A, April 7, 1992.]

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DELTA SET TO LAUNCH

The launch window for tonight's launch of a Delta 2 rocket will be from 11:20 until 11:50 p.m. The flight was originally scheduled for April 2 and has been postponed twice due to high winds. The rocket will carry a Navstar satellite into orbit. ["Delta 2 Launch Set for Thursday," FLORIDA TODAY, p. 2A, April 6, 1992.]

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STS 50: PRE-MATE TESTING

In OPF Bay 3, Columbia is being prepared for payload pre-mate testing; the midbody is being closed out and thermal blankets are being installed in the midbody. Atlantis, now in OPF Bay 1, is undergoing post-flight inspections and tests and preparations to remove the ATLAS payload from the payload bay. Atlantis' next mission (STS 46) will carry the TSS and EURECA payloads. Discovery - in OPF Bay 2 - is undergoing modifications. Structural inspections of the vehicle have been completed. [KSC SHUTTLE STATUS REPORT, 2:30 p.m., April 6, 1992.]

April 7:

STS 49: HYDROGEN TEST COMPLETE

Engineers continue to analyze the data accumulated from yesterday's Flight Readiness Firing of Endeavour's main engines at Launch Complex 39B. Technicians at the pad have also completed a gaseous hydrogen injection test in the Orbiter's aft compartment. Work in progress: post flight readiness firing operations at the launch pad; gaining access to the aft compartment; connecting the Orbiter midbody umbilical unit to the Orbiter; preparations to offload reactants from the fuel cell storage tanks; raising engine service platforms on the launch platform. Work scheduled: STS 49 payloads transfer to the launch pad this weekend; post-FRF inspections of the main propulsion system and main engines; Terminal Countdown Demonstration Test with the flight crew on April 17. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 7, 1992; Date, THE ORLANDO SENTINEL, p. A-3, April 7, 1992.]

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COLUMBIA: AMMONIA SYSTEM SERVICED

Columbia's ammonia system has been serviced in OPF Bay 3 and the forward reaction control system has been checked out. Work in progress: payload pre-mate testing; Ku-band antenna testing; midbody closeouts; installation of midbody thermal blankets; closeouts of the EDO. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 7, 1992.]

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ATLANTIS: FAUST PAYLOAD REMOVED

In Orbiter Processing Facility Bay 1 technicians have removed the FAUST payload from the cargo bay of Atlantis. Work in progress: post-flight inspections and tests; preparations to remove the ATLAS payload; cleaning of the vehicle's radiators; removing the wheels; preparations to offload residual hypergolic propellants from the Orbiter. In OPF Bay 2, Discovery continues to undergo extensive modifications; workers are preparing to install the Orbiter's radiators. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 7, 1992.]

April 8:

NEW ENGINES FOR ENDEAVOUR

Following a final review of information from Endeavour's flight readiness firing, two irregularities were identified in two engines and Shuttle managers have decided to remove and replace Endeavour's three main engines prior to STS 49. Replacing the main engine adds, at most, one or two days of work to the launch preparations already under way, and launch of STS 49 in the first week of May is still anticipated. An official launch date will be announced by managers following the STS 49 Flight Readiness Review now scheduled for April 21. Despite damage to its three main engines and their imminent replacement, NASA officials say a repeat of the FRF will not be necessary. "The test is mostly for checking out the Orbiter and its internal plumbing, not the engines," according to Keith Hudkins, Chief of the Orbiter Division at NASA Headquarters (Washington, D.C.) Engine replacement is less time consuming than replacing faulty components within the three engines which were damaged during the test; three spare engines are ready for installation presently. None of the problems were described as major or potentially life-threatening to the Endeavour crew. A review of test results showed a possibly damaged main combustion chamber in engine No. 1; a vibration problem with a bearing assembly inside the turbopump of engine No. 2; like engine No. 1, engine No. 3 also backfired and may have been damaged in a similar fashion. At Launch Complex 39B, workers have completed the offloading of reactants from Endeavour's fuel storage cells. Work in progress for the Orbiter's upcoming STS 49 mission: post-flight readiness firing operations at the launch pad; gaining access to the aft compartment; raising engine service platforms on the launch platform; circulating hydraulic fluid; analysis of FRF data from the main engines and main propulsion system; analysis of the performance of high pressure oxidizer turbopumps on main engines No. 1 and 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 8, 1992; NASA/KSC News Release, "STS-49 Endeavour Launch Processing Status," April 8, 1992; Banke, FLORIDA TODAY, p. 1A, April 9, 1992; "Shuttle Problem," USA TODAY, p. 3A, April 9, 1992; Date, THE ORLANDO SENTINEL, April 9, 1992.]

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COLUMBIA: STS 50 PROCESSING

In OPF Bay 3, Columbia continues to undergo pre-mate and Ku-band antenna testing; midbody work includes the installation of thermal blankets and closeouts. The EDO is also being closed out. The USML (United States Microgravity Laboratory) will be installed over the weekend. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 8, 1992.]

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ATLANTIS/DISCOVERY UPDATE

The ATLAS payload has been removed from the cargo bay of Atlantis and the Orbiter's auxiliary power units have been deserviced. Work in progress on Atlantis: fit checks of the rotational hand controller with members of the flight crew; post-flight inspections and tests; cleaning the radiators; removing the wheels. Discovery has had its radiators installed and continues to undergo extensive modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 8, 1992.]

April 9:

DELTA: THIRD LAUNCH ATTEMPT TODAY

The third try to launch the Air Force's Delta 2 was successful late this evening. Despite the threat of lightning from clouds near Launch Complex 17B, an Air Force Delta 2 made third launch attempt tonight during a window which extended from 11:20 to 11:50 p.m. Meteorologists said that there was an 80% chance weather favorable for liftoff. Previous

attempts to launch on April 3 and 4 were postponed due to high winds in the launch area. The payload was a Navstar Global Positioning Satellite, a 4,000-pound spacecraft; it will assist both civilians and the military with navigation. The next Delta 2 launch - no earlier than May 7 - will boost the Palapa-B4 communications satellite into space for the Indonesian government. ["Delta Gets 3rd Chance Today," FLORIDA TODAY, p. 4A, April 9, 1992; "Satellite Placed Safely In Orbit," FLORIDA TODAY, p. 4A, April 11, 1992.]

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ENDEAVOUR: ACCESS TO AFT COMPARTMENT

Workers at Launch Complex 39B gained access today to the aft compartment of Endeavour. They removed foam from the joints between the main propulsion system and the three main engines and from other areas to allow inspections. They also began removing instrumentation used in the flight readiness firing, heat shields from the main engines and prepared to install the STS 49 payloads. Work scheduled: moving the rotating service structure away from the Orbiter overnight in preparation for payload installation; transfer of the STS 49 payloads to the launch pad; removal of the radiation blast shield tomorrow; post-FRF inspections of the main propulsion system. Managers decided last night to replace the three main engines following review of irregularities in two of the high pressure oxidizer turbopumps. The engine one pump saw a build up of pressure in the preburner just after it was shut down and engine two saw a slightly elevated frequency in vibration in the ball bearing cage. This work, scheduled to begin Sunday, is expected to have little impact on the processing schedule. Referring to the need to changeout the engines, KSC spokesman Bruce Buckingham said, "It will take a full week to do it, but that's not any extra time in the long run, because it would have taken longer to replace damaged components in the engines. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 9, 1992; Halvorson, FLORIDA TODAY, p. 9A, April 10, 1992; Halvorson, FLORIDA TODAY, April 12, 1992.]

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COLUMBIA: STS 50 PROCESSING

The Space Shuttle Columbia, in OPF Bay 3, is undergoing payload pre-mate and Ku-band antenna testing. Other activities include: close outs of the midbody; installation of thermal blankets in the midbody; closeouts of the EDO and testing of the water spray boilers. The USML (United States Microgravity Laboratory) payload is scheduled for installation on April 11. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 9, 1992.]

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PROCESSING REPORT: ATLANTIS AND DISCOVERY

Work in progress on Atlantis includes: polishing windows; inspections of the main propulsion system; removal of the SSBV payload; offloading of residual hypergolic propellants; removing heat shields and carrier panels from around the main engines; deconfiguring the payload bay. Discovery's processing activities: Orbiter modifications; installation of radiators; structural inspections; installation of the drag chute. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 9, 1992.]

April 10:

STS 49: PAYLOADS TRANSFERRED

The payloads for STS 49 were transferred to Launch Complex 39B overnight and the rotating service structure was moved away from Endeavour in preparation for installing the payloads. Work in progress: removing foam from the joints between the main propulsion system and the three main engines and from other areas to allow inspections; removing instrumentation used in the FRF; removing heat shields from the main engines

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Main propulsion system interface inspections and blast shield and rail removal have also been completed at the pad. Work in progress: main engine removal and replacement and opening of the payload bay doors. Space Shuttle Main Engine (SSME) No. 1 has been removed and its replacement will be installed today. KSC spokesman Bruce Buckingham said, "For the most part, they're going to meet their schedule." Work scheduled: continued replacement of SSMEs with completion of the task coming April 17; installation of payload into Orbiter payload bay on April 14; Terminal Countdown Demonstration Test this week; crew arrival tomorrow and LRR for April 16. Launch remains targeted unofficially for May 5. [Halvorsen, FLORIDA TODAY, p. 10E, April 12, 1992; KSC SHUTTLE STATUS REPORT, 11:00 a.m., April 13, 1992; Brown, FLORIDA TODAY, p. 2A, April 14, 1992.]

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COLUMBIA: MATING COMPLETED

Mating operations connecting Columbia's external tank to its solid rocket boosters have been completed in OPF High Bay 3; the USML payload has been transferred from the Operations and Checkout Building to the OPF and functional tests of the external tank/Orbiter umbilical doors are now finished. Work in progress: installation of the USML payload into the Orbiter payload bay; payload bay cleaning and potable water servicing. Both the drag chute and the payload tunnel are scheduled for installation in Columbia. [KSC SHUTTLE STATUS REPORT, 11:00 a.m., April 13, 1992.]

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ATLANTIS/DISCOVERY PROCESSING

Post-flight deservicing and APU catch bottle drain and deservicing of Atlantis have been completed. Work in progress: main propulsion system leak checks and removal of main engine dome heat shields. Modifications of Discovery continue while technicians prepare to install the Orbiter's payload bay radiators. [KSC SHUTTLE STATUS REPORT, 11:00 a.m., April 13, 1992.]

April 14:

STS 49: PAYLOAD BAY DOORS OPEN

At Launch Complex 39B, the payload bay doors of Endeavour have been opened and the cargo has been installed; main propulsion system interface inspections have been also completed. Work in progress: removal of main engine number 2 and its replacement is underway; only main engine number 3 remains to be removed and replaced. Workers are also installing the mission payload in the cargo bay. "The work is going well and we are on our schedule for engine replacement. We expect to have all three engines replaced by Friday (April 17). Scheduled work: continue replacement of SSMEs; Terminal Countdown Demonstration Test this week with the crew arriving late tonight; Launch Readiness Review set for April 16; Flight Readiness Review set for April 17. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 14, 1992; Banke, FLORIDA TODAY, April 15, 1992.]

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STS 50: USML INSTALLATION

The STS 50 payload - USML - has been installed in Columbia's cargo bay; mating operations connecting the external tank to the Orbiter's solid rocket boosters and external tank/Orbiter umbilical doors functional testing have been completed. Work in progress: USML mechanical mates to the Orbiter; potable water servicing; water spray boiler checks. Work scheduled: payload electrical mates; payload tunnel installation; drag

chute installation and landing gear functional tests. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 14, 1992.]

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ATLANTIS/DISCOVERY PROCESSING

In OPF Bay 1, technicians processing Atlantis have completed post-flight deservicing, main engine test shield removal and APU catch bottle drain and deservicing. Work in progress: main propulsion system leak checks; engine drying operations and leading edge RCC panel #10 replacement. In OPF Bay 2, Discovery continues Orbiter modifications; radiators have been installed and ammonia boiler leak checks have been conducted. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 14, 1992.]

April 15:

ENDEAVOUR: PAYLOAD INSTALLATION

At Launch Complex 39B, the installation of the Intelsat booster and ASEM payloads into the Space Shuttle Endeavour was completed at 5:50 p.m. April 14. All of the electrical conditions with the Orbiter had been completely established by 10:55 p.m. At 10 a.m. this morning workers began the Interface Verification Test (IVT) to verify the electrical connections; it is scheduled to be completed at about 4 p.m. today. The STS 49 astronauts arrived last night from Houston, TX, by T-38 jets at 11:10 p.m.; they are scheduled to conduct a payload inspection at 1 o'clock on the afternoon of April 16. Over the next two days, the crew will have emergency egress training at the launch pad and have fit checks of their helmets, gloves and launch and entry suits. The crew will be aboard Endeavour for the last three hours of the countdown dress rehearsal and will interface with the launch team in Firing Room 1. The clock will begin counting for the test at 8:30 a.m. April 16. The main engine replacement on the Space Shuttle Endeavour began Sunday and is continuing on schedule. The number 2 engine was removed yesterday and the replacement is being installed today. The last engine - number 3 - will be removed tomorrow (April 16) and be replaced on April 17. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 15; Banke, FLORIDA TODAY, p. 2A, April 15, 1992; "Space Shuttle Endeavour to Undergo Engine Test," THE ORLANDO SENTINEL, April 16, 1992.]

April 16:

STS 49: PAYLOAD INSTALLED

The Intelsat booster has been installed in Endeavour's payload bay at Launch Complex 39B and payload integration verification tests have been completed. Work in progress: SSMEs 1,2 and 3 have been removed; replacement SSMEs 1 and 2 have been installed and replacement SSME 3 will be delivered to the pad today and installed tonight; solid rocket booster closeout work; TCDT began today at 8:30 a.m. EDT; Launch Readiness Review is scheduled for 1:00 p.m. EDT today. Work scheduled: continued replacement of SSMEs; Flight Readiness Review set for April 22 at KSC; inertial measurement unit calibrations; APU leak checks. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., April 16, 1992.]

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STS 50: CHECKS AND TESTS

In OPF High Bay 3, technicians have completed USML mechanical mates to Columbia; hydraulic line checks and landing gear functional tests. Work in progress: USML electrical mates to the Orbiter and drag chute modifications and installation preparations. Work scheduled: payload tunnel adapter installation and payload integration verification tests. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., April 16, 1992.]

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ATLANTIS PROCESSING

In OPF Bay 1, technicians have completed main propulsion system leak checks on Atlantis in addition to engine drying operations and leading edge RCC panel replacement. Work in progress: power reactant storage and distribution systems test; payload bay vent filter checks; APU lube oil flush preparations; aft flight deck and midbody deconfigurations. Discovery, in OPF Bay 2, continues to undergo modifications including freon coolant loop leak checks. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., April 16, 1992.]

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SILT SITE DISCUSSED

The Florida Inland Navigation District met with NASA representatives, the Merritt Island National Wildlife Refuge and the U. S. Army Corps of Engineers to discuss NASA's use of land on the Indian River. FIND Assistant Executive Director David Roach said, "We still have a lot of things to work through, but we're feeling very positive about this site..." which "has been used for fill in road and building construction around the area. We're going to try and put nature back." [Nicholson, FLORIDA TODAY, p. 2B, April 17, 1992.]

April 17, 1992

FINAL SSME INSTALLED

The Space Shuttle Endeavour, being readied for its STS 49 mission at Launch Complex 39B, now has a full complement of three new engines. The last, #3, was installed last night. The Launch Readiness Review has been completed as have payload integration and payload integration verification tests. Work in progress: TCDT began at 11:00 a.m. this morning; solid rocket booster closeout work; solid rocket booster accumulator installation; main engine service platform and heat shield installation. Work scheduled: FRR scheduled for April 22 at Kennedy Space Center; inertial measurement unit calibrations; auxiliary power unit leak checks; flight readiness test for main engines and main propulsion system. [KSC SHUTTLE STATUS REPORT, 12:00 p.m., April 17, 1992; Banke, FLORIDA TODAY, p. 1A, April 17, 1992; Banke, FLORIDA TODAY, April 19, 1992.]

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COLUMBIA: DRAG CHUTE INSTALLED

The drag chute and main landing gear wheel and tire assembly have been installed in the Space Shuttle Columbia in anticipation of its upcoming STS 50 mission. Work in progress: United States Microgravity Laboratory (USML) electrical mates to the Orbiter; nose landing gear installation; payload integration verification tests. The payload tunnel adapter has been scheduled for installation. [KSC SHUTTLE STATUS REPORT, 12:00 p.m., April 17, 1992.]

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ATLANTIS: PROPULSION LEAK CHECKS

Auxiliary power unit (APU) lube oil flush preparations and main propulsion system leak checks on Atlantis have been completed as part of its post-flight processing following its STS 45 mission. Work in progress: power reactant storage and distribution systems test; payload bay vent filter checks; aft flight deck and mid-body deconfigurations; auxiliary power unit water valve changeout operations; main engine foam insulation removal; continue stacking solid rocket boosters in the Vehicle Assembly Building. The Orbiter's main engines will be removed next week. Meanwhile, Discovery continues to undergo extensive modifications and processing. The Orbiter has in the past week undergone freon coolant loop decay checks and the removal of the main propulsion system. [KSC

SHUTTLE STATUS REPORT, 12:00 p.m., April 17, 1992; Banke, FLORIDA TODAY, p. 5A, April 19, 1992.]

April 20:

TCDT SUCCESS: ENDEAVOUR

Last week, the three main engines of Endeavour were replaced and the Terminal Countdown Demonstration Test (TCDT) was successfully held April 17. Work in progress: installing heat shields around the three main engines; preparations for the main engine flight readiness test; post-FRF inspections of the main propulsion system; leak checks of the liquid oxygen and hydrogen systems. Work scheduled: Flight Readiness Review April 22; helium signature leak test at week's end. [KSC SHUTTLE STATUS REPORT, 12:00 p.m., April 17, 1992.]

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STS 50: COLUMBIA PREPARATIONS

In Orbiter Processing Facility Bay 3, Columbia has had its drag chute installed. Work in progress: interface verification tests of the USML payload; separating wire bundles in the Orbiter's midbody; closeouts of the midbody. Leak and functional tests of Atlantis' APUs and the Orbiter's forward reaction control system have begun. Technicians are also inspecting the vehicle's hydraulic system. The three main engines of Atlantis are scheduled to be removed this week. Discovery is undergoing structural inspections and modifications along with leak checks of the freon coolant loop. [KSC SHUTTLE STATUS REPORT, 12:00 p.m., April 17, 1992.]

April 21:

STS 49: ENDEAVOUR PAD PROCESSING

At Launch Complex 39B, Endeavour is being prepared for its main engine flight readiness test. KSC spokeswoman Lisa Malone said, "It's a good test of the engines; it tells you that the engines are going to perform as commanded." Technicians are smoothing the interference fit between the heat shield 'eyelids' for the No. 3 main engine; workers are also conducting post-FRF inspections of the main propulsion system and leak checks of the liquid oxygen and hydrogen systems. Endeavour's Flight Readiness Review takes place tomorrow and technicians will conduct a helium signature leak test of the main engines and main propulsion system this weekend. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 21, 1992; Halvorson, FLORIDA TODAY, p. 3A, April 21, 1992.]

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STS 50: USML TESTS COMPLETED

Interface verification tests of the United States Microgravity Laboratory payload have been completed aboard Columbia in OPF Bay 3. Work in progress: closeouts of the midbody; preparations to install the spacelab tunnel adapter and modifications to allow more crew stowage for the upcoming extended mission. [SEE: EDO.] [KSC SHUTTLE STATUS REPORT, 10 a.m., April 21, 1992.]

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ATLANTIS: OPF BAY 1

Tests of Atlantis' power reactant and storage distribution system (PRSD) are underway in OPF Bay 1. Other work in progress includes: preparations to remove the three main engines; servicing and sampling of the fuel cell coolant system; leak and functional tests of the auxiliary power units and the forward reaction control system; inspections of the hydraulic system. The three main engines are scheduled for removal this week. Discovery is undergoing removal of the helium tanks for its main propulsion system;

removal of the PRSD tanks; leak checks of the freon coolant loops and continuing with inspections and modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 21, 1992.]

April 22:

ENDEAVOUR: HEAT SHIELDS INSTALLED

Endeavour's main engine heat shields have been installed at Launch Complex 39B and STS 49 continues on schedule for launch in the first week of May. Work in progress: Flight Readiness Review; main propulsion system flight readiness test and leak checks; post-FRF processing operations. Work scheduled: auxiliary power unit leak checks and ordnance operations. [KSC SHUTTLE STATUS REPORT, 12:00 NOON, April 22, 1992.]

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NASA MAY BUY SOYUZ CAPSULE

"Congress asked us to look at the Soviet assets," said Richard Kohrs, Director of the Space Station Program, at the 29th annual Space Congress (Cocoa Beach, FL). NASA is thinking about purchasing a Russian Soyuz capsule for use as an emergency crew rescue vehicle until another emergency escape vehicle is constructed. Two American vehicles are being considered. Final Space Station design review is on schedule for next year. [Brown, FLORIDA TODAY, p. 1A, April 23, 1992.]

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COLUMBIA: LANDING GEAR INSTALLED

In preparation for its upcoming STS 50 mission, Columbia has had its nose landing gear installed and completed payload integration verification tests. Work in progress: midbody closeouts; installation of payload bay liners; preparations to leak check and install tunnel adapter; hydraulic system fill and bleed. Work scheduled: tunnel adapter installation. [KSC SHUTTLE STATUS REPORT, 12:00 NOON, April 22, 1992.]

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ATLANTIS: STS 46 PROCESSING

Main engine foam insulation has been removed from Atlantis' engines in OPF Bay 1. Work in progress: APU leak and functional tests; forward reaction and control system leak and functional checks; water spray boiler leak and functional tests; payload bay vent filter checks; aft flight deck and midbody deconfigurations; stacking of solid rocket boosters in Vehicle Assembly Building. The Orbiter's main engines are scheduled for removal. Discovery has had its main propulsion system helium tank removed along with the vehicle's power reactant and storage distribution tank. Work in progress on Discovery: continued modifications and freon coolant loop leak and decay checks. [KSC SHUTTLE STATUS REPORT, 12:00 NOON, April 22, 1992.]

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ENDEAVOUR TO GO MAY 4

NASA today concluded the Flight Readiness Review for STS 49, selecting May 4 as the launch date for the maiden flight of the Space Shuttle Endeavour. KSC spokeswoman **Lisa Malone** said, "It's one of the biggest missions we've ever flown in the history of the Space Shuttle Program. And on top of that, it's the maiden voyage of Endeavour." Shuttle mission STS 49 will be launched from Launch Complex 39B during a window that extends from 8:34 to 9:27 p.m. EDT. The 6-day, 23-hour mission will end with a landing on May 11 at Edwards Air Force Base, CA. A 7-member crew will guide Endeavour on her maiden flight; the Commander is **Daniel C. Brandenstein** and the Pilot is **Kevin P. Chilton**. Mission Specialists are **Bruce E. Melnick**, **Pierre Thuot**, **Richard J. Hieb**, **Kathryn**

C. Thornton and Thomas D. Akers. The primary mission objective for STS 49 is to rendezvous, repair and reboost an INTELSAT communications satellite stranded in a low Earth orbit after launch aboard an expendable vehicle. Another mission goal is to conduct extravehicular activities (spacewalks) to evaluate equipment and techniques for constructing Space Station Freedom. Three consecutive space walks will be performed, a first for the Shuttle Program. ["STS-49 Space Shuttle Launch Advisory," NASA/KSC News Release, April 22, 1992; Halvorson, FLORIDA TODAY, p. 4A, April 23, 1992.]

April 23:

ENDEAVOUR: ENGINES TESTED

Technicians at Launch Complex 39B have successfully conducted the main engine flight readiness test of Endeavour's three main engines; the Flight Readiness Review was completed yesterday and managers chose May 4 as the official launch date for the Orbiter's STS 49 mission. Work in progress: tests of the four space suits tucked inside the airlock; cycling of the Orbiter's aerosurfaces; preparations for the helium signature leak test of the main engines and main propulsion system which is scheduled for tomorrow; post-FRF inspections of the main propulsion system and leak checks of the gaseous oxygen system. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 23, 1992; "Endeavour Launch Set for May 4," THE ORLANDO SENTINEL, p. A-10, April 23, 1992.]

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COLUMBIA: MORE MODIFICATIONS FOR STS 50

Modifications of Columbia to prepare it for its upcoming STS 50 mission continue in OPF Bay 3. Other work in progress: tests of the Orbiter's flight control aerosurfaces; preparations for the brake anti-skid test; closeouts of the midbody; installation of the spacelab tunnel adapter. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 23, 1992.]

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ATLANTIS: PRSD TEST

Atlantis continues in processing for its next mission: STS 46. Activities include: tests of the power reactant storage and distribution system (PRSD); removal of the three main engines; leak and functional tests of the auxiliary power units and the forward reaction control system and inspections of the hydraulic system. Processing activities of Discovery include: removal of the helium tanks for the main propulsion system; removal of the PRSD tanks; leak checks of the freon coolant loops; structural inspections and more Orbiter modifications. [KSC SHUTTLE STATUS REPORT, 11 a.m., April 23, 1992.]

April 24:

ENDEAVOUR: EVA SUITS INSTALLED

The four space suits stored inside Endeavour's airlock have now been tested and the Orbiter's aerosurfaces have been cycled as Endeavour awaits its May 4 launch on its STS 49 mission. Work in progress: preparations for the helium signature leak test of the main engines and main propulsion system; post-FRF inspections of the main propulsion system; first portion of ordnance installation; preparations to pressurize the hypergolic propellant tanks for flight. On April 28, the payload bay doors will be closed for flight; aft closeouts are also scheduled. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 24, 1992.]

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COLUMBIA: TUNNEL ADAPTER INSTALLED

The spacelab tunnel adapter has been installed in Columbia during processing work in Orbiter Processing Bay 3. A nose wheel steering test has also been completed. Work

in progress: tests of the Orbiter's flight control aerosurfaces; brake anti-skid test; closeouts of the midbody; tests of the spacelab tunnel adapter and modifications to allow more crew stowage for the upcoming STS 50 mission. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 24, 1992.]

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ATLANTIS: MAIN ENGINES REMOVED

The three main engines of Atlantis have been removed from the Orbiter during processing in OPF Bay 1. Work in progress: tests of the power reactant storage and distribution system (PRSD); leak and functional tests of the auxiliary power units and the forward reaction control system; servicing of the water spray boilers; installation of the remote manipulator arm. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 24, 1992.]

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DISCOVERY: HELIUM TANKS REMOVED

During processing in OPF Bay 2, Discovery's main propulsion system's helium tanks are being removed. Technicians are also removing the PRSD tanks, conducting leak checks of the freon coolant loops and structural inspections and making further Orbiter modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 24, 1992.]

April 26:

ENDEAVOUR PASSES KEY LEAK TEST

Endeavour passed its helium signature leak test today; that cleared the way for liftoff May 4 of the newest Orbiter on its maiden STS 49 mission. Kennedy Space Center spokeswoman Lisa Malone said the test revealed no problems with the Shuttle's propulsion system. Also, today, technicians began installing ordnance which will be connected in the week remaining before launch. Workers are preparing to pressurize the hypergolic propellant tanks for flight. Work scheduled: closing the payload bay doors for flight and aft closeouts. The crew of Endeavour is due to arrive at KSC on May 1. [Brown, FLORIDA TODAY, p. 2A, April 27, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., April 27, 1992.]

April 27:

ENDEAVOUR LAUNCH DELAYED

Endeavour's maiden launch will be delayed three days to accommodate photography of the liftoff. KSC Director Robert L. Crippen said, "The thinking was we were within just a few days of being able to do it, so why not do it? All of our criteria has always said we like daylight better than dark." Launch is now scheduled for May 7 between 7:06 and 7:55 p.m. The sun sets on that day at 8:00 p.m. Crippen added, "Since we were on the borderline, we decided to go ahead and to the cautious thing." A Delta 2 launch originally set for May 7 has been delayed due to minor problems; these opened May 7 as a potential launch date for Endeavour. [Banke, FLORIDA TODAY, p. 1A, April 28, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-6, April 28, 1992; "Liftoff of New Space Shuttle Is Rescheduled," THE NEW YORK TIMES, p. B8, April 28, 1992.]

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SPACE LIFE SCIENCES TRAINING

NASA has selected 48 college students, including 20 international students, to participate in its annual Space Life Sciences Training Program at the Kennedy Space Center, FL. The intensive 6-week summer residence training program is for college students interested in life sciences, pre-medicine, bioengineering or related fields. The program is designed to attract college students towards a career in space life sciences research.

Selected students work with NASA researchers in planning flight and ground support experiments. In addition to offering research experience, the curriculum utilizes lectures, tours and special projects to provide complete overview of the field of space life sciences. The program will be held from June 20, 1992, through July 31, 1992. [NASA/KSC News Release No. 92-53, April 27, 1992.]

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STS 50: TUNNEL ADAPTER TESTED

Technicians in OPF Bay 3 have tested the spacelab tunnel adapter which is being prepared for installation in Columbia for use in its upcoming STS 50 flight. Workers are also closing out the midbody and making modifications to allow more crew stowage for the extended mission. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 27, 1992.]

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ATLANTIS: PRSD TESTED

The power reactant storage and distribution system (PRSD) aboard Atlantis has been tested and leak and functional tests of the forward reaction control system have also been completed. Work in progress: testing of the main propulsion system; orbital maneuvering system functional tests; leak and functional tests of the auxiliary power units; servicing of the water spray boilers and installation of the remote manipulator arm. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 27, 1992.]

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DISCOVERY: MODIFICATIONS CONTINUE

While modifications continue to be made on Discovery, other work is in progress: removal of the helium tanks for the main propulsion system; removal of the PRSD tanks; leak checks of the freon coolant loops and structural inspections of the Orbiter. Discovery is being modified in OPF Bay 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 27, 1992.]

April 28:

GOLDIN MAKES APPOINTMENTS

NASA Administrator **Daniel S. Goldin**, who succeeded former Administrator **Richard H. Truly** on April 1, announced today the following appointments at NASA Headquarters:

Major General Jeremiah W. Pearson III , USMC to be Associate Administrator, Office of Space Flight
Bryan D. O'Connor , former NASA Astronaut to be Deputy Associate Administrator, Office of Space Flight
Charles F. Bolden , former NASA Astronaut to be Assistant Deputy Administrator
Frederick Gregory , former NASA Astronaut to be Associate Administrator, Office of Safety and Mission Quality
Allison McNally Executive Officer
Dee Lee Executive Assistant to the Deputy Administrator

Goldin said, "This will be the first in a number of personnel announcements during the coming months." The changes are aimed at "reducing our cost of doing business and eliminating the bureaucracy that is stifling the creative thought process," he added. Pearson replaces **William Lanier**, a former astronaut. [NASA/KSC News Release No. 92-34, April 28, 1992; Eisler, FLORIDA TODAY, p. 1A, April 29, 1992; "NASA Chief Appoints 4 to Key Positions," THE ORLANDO SENTINEL, April 29, 1992.]

April 29:

ENDEAVOUR: CARGO BAY DOORS CLOSED

In preparation for its STS 49 mission May 7, Endeavour's payload bay doors have been closed - at 5:50 p.m. yesterday. Work in progress: purges of the external tank; closing out of the aft compartment including final inspections of the auxiliary power units, foaming of main propulsion system lines, and closeouts of the avionics bays; preparations to begin the launch countdown next week. Work scheduled: closing out the aft compartment; final ordnance operations; launch at 7:06 p.m. with the window extending until 7:55 p.m. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 29, 1992; "Endeavour Preened at KSC," FLORIDA TODAY, p. 2A, April 29, 1992.]

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COLUMBIA: SPACELAB TUNNEL INSTALLED

In Orbiter Processing Bay 3, technicians have installed the spacelab tunnel in the Space Shuttle Columbia in preparation for its upcoming STS 50 mission. Work in progress: filling and bleeding of the hydraulic system; crew stowage modification for extended flights; servicing the auxiliary power units with water; electrical redundancy checks of the orbital maneuvering system and the reaction control system; brake anti-skid test. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 29, 1992.]

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ATLANTIS: TESTS IN OPF BAY 1

The Space Shuttle Atlantis is undergoing a number of tests in Orbiter Processing Facility Bay 1: orbital maneuvering system functional tests; leak and functional tests of the auxiliary power units and tests of the main propulsion system. Other work in progress includes: thermal protection system operations; configuring the aft flight deck for the STS 46 mission and troubleshooting the Ku-band antenna. In OPF Bay 2, work continues on Discovery which is undergoing structural inspections and modifications. The PRSD tanks are being removed and leak checks of the freon coolant loops are being made. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 29, 1992.]

April 30:

ORBITER-NAMING PARTICIPANTS

The two national winning student teams and many of the educators who participated in NASA's Orbiter-Naming Program will meet May 5-7. A reception is planned for May 5 at the Holiday Inn (Indialantic, FL). Participants in the program will be interviewed at the Kennedy Space Center Banana Creek launch viewing site May 7, prior to the launch of Endeavour's maiden mission, STS 49. The name of the Space Shuttle Orbiter, Endeavour, resulted from a nationwide Orbiter-naming competition supported by educational projects created by student teams in elementary and secondary schools. The two national winning teams were selected from over 6,100 entries involving more than 71,000 students.

Congressman Tom Lewis (R-FL), who introduced legislation in March 1986 calling for the replacement Orbiter [for Challenger] to be named from suggestions submitted by students, will be the featured speaker during the May 5 reception. In addition, the nine students of the Senatobia Middle School (Senatobia, MS) team and eight members of the Tallulah Falls School, Inc. (Tallulah Falls, GA) will present their projects. These teams were the Division I (K-Grade 6) and Division II (Grades 7-12) winners respectively in the Orbiter-naming competition. [NASA/KSC News Release No. 92-37, April 30, 1992.]

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STS 49: EXTERNAL TANK PURGED

"We're chugging on," said KSC spokesman Dick Young about LC 39B efforts to finish preparing NASA's newest Orbiter for its maiden voyage. Endeavour's external tank has been purged in STS 49 pre-launch preparations at Launch Complex 39B. Purges of the power reactant storage and distribution system are underway as are closeouts of the aft compartment and avionics bays, final inspections and preparations to begin the launch countdown May 4. Young also said that workers will complete the application of foam insulation to fuel lines within the Orbiter's main propulsion system. The aft compartment is expected to be closed out tomorrow. Final ordnance operations begin May 1. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 30, 1992; Halvorson, FLORIDA TODAY, p. 6A, April 30, 1992.]

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STS 50: TIRES CHECKED

Pressure checks of the main landing gear tires on Columbia have been completed as launch day for STS 50 nears. Work in progress: filling and bleeding the hydraulic system; crew stowage modification for extended flights; electrical redundancy checks of the orbital maneuvering system and the reaction control system; brake anti-skid test and preparations to install the waste containment system. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 30, 1992.]

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ATLANTIS: WORK IN PROGRESS

Preparations for the STS 46 mission of Atlantis continue in OPF Bay 1: orbital maneuvering system functional tests; leak and functional tests of the auxiliary power units; thermal protection system operations; configuring the aft flight deck for the STS 46 mission; testing of the Ku-band antenna drive assembly; testing of the main propulsion system. Discovery remains in OPF Bay 2 where it is undergoing structural inspections and modifications. The removal of the vehicle's PRSD tanks is underway as are leak checks of the freon coolant loops. [KSC SHUTTLE STATUS REPORT, 10 a.m., April 30, 1992.]

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May 1:

STS 49: PRSD SYSTEM PURGED

At Launch Complex 39B, workers have purged Endeavour's power reactant storage and distribution system and completed final ordnance operations and checks of firing circuits. Work in progress: closing out the aft compartment including final inspections, closeouts of the avionics bays and removal of work platforms; installation of flight doors on the aft compartment; preparations to begin the launch countdown May 4. Work scheduled: STS 49 flight crew arrival; launch countdown start at 11 p.m. May 4 at the T-43 hour mark. Launch of STS 49 is set for 7:06 p.m. EDT with the window extending until 7:55 p.m. May 7. The STS 49 mission is the first for the Space Shuttle Endeavour; other firsts include: three spacewalks and a drag chute-assisted landing at Edwards Air Force Base (CA). [KSC SHUTTLE STATUS REPORT, 10 a.m., May 1, 1992; "Technicians Continue Work Toward Endeavour's Launch," FLORIDA TODAY, p. 2A, May 2, 1992; Brown, FLORIDA TODAY, p. 1A, May 4, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-14, May 3, 1992.]

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COLUMBIA: USML LEAK CHECKS DONE

Leak checks of Columbia's United States Microgravity Laboratory payload tunnel have been completed. Work in progress: interface verification testing of the USML tunnel; crew stowage modification for extended flights; electrical redundancy checks of the orbital maneuvering system and the reaction control system. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 1, 1992.]

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ATLANTIS AND DISCOVERY

In OPF Bay 1, Atlantis is undergoing tests of its orbital maneuvering system and leak and functional tests of the auxiliary power units. Thermal protection system operations are underway and the aft flight deck is being configured for the STS 46 mission. Discovery continues to be modified and inspected in OPF Bay 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 1, 1992.]

May 2:

TWO NIGHT LAUNCHES NEXT WEEK

"You could say it's going to be the culmination of all the hard work the team has put in over the past year," said KSC spokeswoman Lisa Malone, speaking of the May 7 launch of Endeavour on its maiden voyage, STS 49. That launch is scheduled to occur at 7:06 p.m. EDT. A Delta 2 launch on May 9 will be the second night launch of the week; the windows are from 7:43 to 8:00 p.m. and from 8:31 to 9:49 p.m. Between these two launches the six surviving Mercury astronauts will revisit Brevard for the 30th anniversary of the first three manned orbital flights. Mrs. Betty Grissom, widow of the late Virgil "Gus" Grissom, will be joined in ceremonies at the U. S. Astronaut Hall of Fame by John Glenn, Scott Carpenter, Walter Schirra, Gordon Cooper, Deke Slayton and Alan Shepard. [Halvorson, FLORIDA TODAY, p. 1A, May 3, 1992.]

May 4:

LAUNCH MINUS THREE DAYS: STS 49

There is a 60 percent chance of acceptable weather conditions on May 7 at launch time for Endeavour's maiden voyage, STS 49. The concern is for thick low level clouds in the area. The aft compartment of the Orbiter was closed May 1; afterward the solid rocket

boosters and the external tank were closed. Work in progress: preparations to begin the launch countdown at 11 p.m. tonight at the T minus 43 hour mark; removing platforms from the middeck; removing covers from the reaction control system thrusters; washing down the mobile launcher platform and the flame trench. Work scheduled: arrival of the STS 49 flight crew at 7:00 p.m. tonight; move the rotating service structure away from the vehicle starting at 6:00 p.m. May 6; loading the external tank with its flight load of propellants beginning at 10:16 a.m. May 7; launch is scheduled at 7:06 p.m. May 7 and the window extends to 7:55 p.m. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 4, 1992; Diller, NASA/KSC, "L-3 Day Weather Forecast for STS-49...", May 4, 1992.]

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CHUTE LEAK CHECK: COLUMBIA

Workers in OPF Bay 3 have completed a structural leak check of Columbia's drag chute. Preparations for the Orbiter's STS 50 mission continue: leak checks of the elevon cove seals; interface verification testing of the USML tunnel; crew stowage modification for extended flights; testing of the communications and radar systems. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 4, 1992.]

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ATLANTIS AND DISCOVERY: PROCESSING

Technicians in OPF Bay 1 have installed Atlantis' new beefed-up main landing gear wheels and serviced the auxiliary power units with lube oil. Work in progress: orbital maneuvering system functional tests; thermal protection system operations; configuring the aft flight deck for the STS 46 mission; preparation of the hydraulic system for testing. Inspections and modifications of Discovery continue unabated in OPF Bay 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 4, 1992.]

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ENDEAVOUR CREW ARRIVES AT KSC

Endeavour's seven-member crew arrived at KSC shortly after 7:00 p.m. ready and eager to begin the STS 49 mission. "We've been training real hard for the last year or so, and we aren't going to get any smarter, so now's a good time to go fly," said Mission Specialist Kathryn C. Thornton on her arrival. Fellow Mission Specialist Thomas D. Akers said, "I really feel lucky to be assigned to a flight like this. I can't wait to get back and tell you all about it." Other crew members include Commander Daniel C. Brandenstein, Pilot Kevin P. Chilton and Mission Specialists Bruce E. Melnick, Richard J. Hieb and Pierre Thuot. [Halvorson, FLORIDA TODAY, p. 1A, May 5, 1992; "Endeavour Crew Prepares for Launch," USA TODAY, p. 4A, May 5, 1992; Date, THE ORLANDO SENTINEL, May 5, 1992.]

May 5:

STS 49: COUNTDOWN BEGINS

The launch countdown for the STS 49 mission of Endeavour began on time at 11 p.m. yesterday. There is a 30 percent chance of acceptable weather conditions on May 7 at launch time; the concern is for showers or thunderstorms and thick low level clouds in the area. Conditions improve on May 8 to a 40 percent chance of having acceptable weather. The flight crew is scheduled for a brief medical exam, a review of flight data files, perform fit checks with crew equipment and will be briefed by the vehicle integrated test team. Work in progress: countdown; preparations to load the fuel cell storage tanks with cryogenic reactants; final set ups of the hazardous gas detection system; activation of the navigation aids; preparing the main engines for flight. Work scheduled: loading the fuel cell storage tanks with reactants tonight; rotate the rotating service structure away

from the vehicle at 6 p.m. May 6; loading the external tank with its flight load of propellants starting at 10:16 a.m. May 7. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 5, 1992; Halvorson, FLORIDA TODAY, May 6, 1992.]

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STS 50: PROCESSING CONTINUES

The Space Shuttle Columbia, in OPF Bay 3, continues to undergo processing activities for its upcoming STS 50 mission: servicing the ammonia boiler; installation of the Orbiter's waste containment system; testing of the communications system; functional checkout of the orbital maneuvering system crossfeed lines; leak checks of the elevon cove seals; crew stowage modification for extended flights. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 5, 1992.]

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ATLANTIS: MORE TESTS

Atlantis is undergoing several tests this week in OPF Bay 1: orbital maneuvering system functional tests; testing of the hydraulic system and of the nose wheel steering system; and thermal protection system operations. The aft flight deck is being configured for the STS 46 mission. The Orbiter's three main engines will be installed this week. Discovery is being modified in OPF Bay 2 and is undergoing structural inspections, thermal protection system operations and freon coolant loop troubleshooting. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 5, 1992.]

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THOMAS O. PAINE, FORMER ADMINISTRATOR

Upon learning of the death of Dr. Thomas O. Paine, the third Administrator of NASA, NASA Administrator Daniel S. Goldin issued the following statement: "The Agency mourns the death of Tom Paine, an outstanding American. Over the years, I had the privilege of working with Tom personally. I found him to be a man of vision and integrity. Tom's leadership of NASA through the first several moon landings was nothing short of exemplary and later as Chairman of the National Commission on Space in the mid-1980s, his direction of this Presidentially appointed group formulated a bold agenda to carry America's civilian space enterprise into the 21st century. Within the past six months, the nation has been saddened by the passing of three former NASA Administrators - James C. Fletcher in December, James E. Webb in February and now Tom Paine. Their accomplishments and legacies will long endure." Paine died of cancer [on May 4] at his home (Brentwood, CA); he was 70. [NASA/KSC News Release No. 92-41, May 5, 1992; "Ex-NASA Chief Dies of Cancer," FLORIDA TODAY, p. 7A, May 6, 1992; Steinberg, THE NEW YORK TIMES, May 7, 1992; "Thomas O. Paine, 70, NASA Administrator," THE WASHINGTON TIMES, May 7, 1992; "Thomas O. Paine, Led NASA During Era of Moon Landings," CHICAGO TRIBUNE, May 6, 1992; "Thomas Paine Dies; Led NASA Through Early Apollo Missions," THE WASHINGTON POST, May 8, 1992.]

May 6:

PELLERIN TO FILL SAFETY POST

NASA Administrator Daniel S. Goldin today announced the appointment of Dr. Charles J. Pellerin, Jr. to the position of Deputy Associate Administrator for Safety and Mission Quality. In addition, he will serve as Special Assistant to the Administrator for long-range planning. In this capacity, he will work with Assistant Deputy Administrator Charles F. Bolden. Pellerin has served since 1983 as Director of Astrophysics in NASA's Office of Space Science and Applications. Many of the most complex satellites ever conceived were completed under his leadership and launched in recent years. The scientific results

from these missions, which include the Cosmic Background Explorer (COBE), Hubble Space Telescope and Compton Gamma Ray Observer, are now changing how we view the universe and humanity's place in it. Pellerin began his NASA career as an aerospace engineer at the Goddard Space Flight Center (Greenbelt, MD), where he was involved in the engineering of rocket instrumentation and later in the use of sounding rockets for scientific research. In 1975, he moved to NASA Headquarters and for 5 years managed the development and integration of scientific instrumentation for flight on the Space Shuttle. In 1974, Pellerin was awarded a Ph.D. in physics from the Catholic University of America. He has received many honors, including the Presidential Rank Award, Catholic University Science Alumni Award and NASA's Outstanding Leadership Medal. [NASA/KSC News Release No. 92-59, May 6, 1992; "Goldin Appoints Safety Associate," FLORIDA TODAY, May 17, 1992.]

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ENDEAVOUR: L-2 DAY REVIEW COMPLETED

Shuttle Program Director Leonard S. Nicholson, speaking at a KSC news conference, said, "I consider the first launch of Endeavour to be the end of [the Challenger] era and the starting of another" in which the role of astronauts working in space takes a new emphasis. At Launch Complex 39B, technicians and managers of the STS 49 mission have completed their L-2 day review of the pre-launch operations. Cryogenic fuel cell loading operations are also finished. Work in progress: the launch countdown continues on time and without incident; the clock will hold today at 3:00 p.m. for a scheduled 13-hour, 16-minute built-in hold; rotating service structure move preparations. Work scheduled: rotation of the service structure from the vehicle is scheduled for tonight; loading of the external tank with cryogenic fuels is scheduled to begin at 10:16 a.m. May 7 with launch targeted for 7:06 p.m. EDT with a window extending until 7:55 p.m. Weather continued to be a concern with the probability of criteria violation ranging from 60 to 70 percent until launch time. [Broad, THE NEW YORK TIMES, p. A13, May 7, 1992; KSC SHUTTLE STATUS REPORT, 12 Noon, May 6, 1992; "Launch Day Weather Forecast for STS 49," NASA/KSC News Release, May 7, 1992; Halvorson, FLORIDA TODAY, p. 1A, May 6, 1992.]

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COLUMBIA: OMS CROSSFEED LINES TESTED

Tests of Columbia's orbital maneuvering system crossfeed lines have been completed. Technicians in OPF Bay 3, where the vehicle is being processed, are servicing Columbia's ammonia boiler, installing and checking the Waste Collection System and preparing the crew equipment interface test. [KSC SHUTTLE STATUS REPORT, 12 Noon, May 6, 1992.]

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ATLANTIS: BRAKES TESTED

In OPF Bay 1, Atlantis has had its brake and anti-skid tests completed along with nose wheel steering operations and hydraulic fill and bleed functional tests. Work in progress: preparations for main engine removal beginning tonight and stacking of solid rocket boosters for STS 46 in the Vehicle Assembly Building. Technicians in OPF Bay 2, have completed installing the power reactant and storage distribution tank in Discovery. Work in progress on Discovery: modifications; freon coolant loop leak and decay checks and window installations. [KSC SHUTTLE STATUS REPORT, 12 Noon, May 6, 1992.]

May 7:

STS 49 LAUNCH SUCCESS!

"It was fantastic. When I saw the flames shoot out of the bottom of the Endeavour, I said a new fresh page is starting," said new NASA Administrator **Daniel S. Goldin** who as in attendance as Endeavour lifted off from Launch Complex 39B at 7:40:07 p.m. EDT tonight. It made a trouble-free climb to orbit to begin Shuttle mission STS 49. Shuttle Program Director **Leonard S. Nicholson** said, "I consider the first launch of Endeavour to be the end of that [the Challenger accident] era and the starting of another." A normal engine firing to circularize Endeavour's orbit ensued, putting the spacecraft into the planned 182 by 140 nautical mile orbit. Launch was delayed by 34 minutes because of weather conditions at the Kennedy and the Transoceanic Abort sites and for the resolution of one of the master events controllers (MEC). The MEC relays commands from the Orbiter's computers to fire explosive charges to the SRB holddown bolts at launch and to separate the boosters and tank in flight. Minimal damage was reported at launch pad 39B. Mobile launcher platform 2 will be transferred to the Vehicle Assembly Building tomorrow evening.

The solid rocket boosters are being recovered by the two retrieval ships, the Liberty Star and the Freedom Star. Both frustrums and parachutes are onboard the ships. The boosters will be towed back to Hangar AF at Cape Canaveral Air Force Station. High sea state conditions are slowing the retrieval operation somewhat. Impact coordinates for the left booster were 28 degrees, 41.9 minutes north and 78 degrees, 03.32 minutes west. Coordinates for the right booster were 28 degrees, 41.6 minutes north and 78 degrees, 03.7 minutes west. They landed about 140 miles due east of KSC and about 6 and a half miles from the retrieval ships. Noting that three spacewalks are scheduled for this STS 49 mission, National Space Society Program Director **David Brandt** said, "They need to start practicing spacewalks in a big way, and NASA knows that. Certainly they are going to have to do a lot of spacewalking when they get to the Hubble repair mission next year, and they'll have to do even more of it when they begin building the Space Station." Former U. S. Representative **Bill Nelson**, who flew on STS 61C, said, "This is a precursor to us doing much bigger and much more exciting things in space. But we need this kind of experience and history behind us in order to keep doing more and more in space." [Banke, FLORIDA TODAY, p. 1A, May 7, 1992; Broad, THE NEW YORK TIMES, May 7, 1992; Broad, THE NEW YORK TIMES, P. A13, May 8, 1992; MISSION CONTROL CENTER STATUS REPORT #1, May 8, 1992; Sawyer, THE WASHINGTON POST, May 7, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-11, May 7, 1992; KSC SHUTTLE STATUS REPORT, May 8, 1992; Halvorson, FLORIDA TODAY, pp. 1A-2A, May 8, 1992; Date, THE ORLANDO SENTINEL, May 8, 1992; "Endeavour Soars After Weather Delay," USA TODAY, May 8, 1992; Stewart, LOS ANGELES TIMES, May 8, 1992; Sawyer, THE WASHINGTON POST, May 8, 1992; "Shuttle Sets Off to Repair Satellite," THE WASHINGTON TIMES, May 8, 1992; "Shuttle Endeavour Blasts Off On Maiden Flight," PHILADELPHIA INQUIRER, May 8, 1992.]

May 8:

ASTRONAUT HONORS TODAY

Two more names will be added at 10:30 a.m. today to the Astronauts Memorial in a ceremony at Spaceport USA: **Manley "Sonny" Carter**, who died in a 1991 plane crash and Air Force Captain **Mike Adams** who died in an X-15 rocket plane crash in 1967. Adams had qualified for astronaut wings for flying above 50 miles, the beginning of space. At the U.S. Astronaut Hall of Fame and Space Camp Florida (Titusville, FL) the six surviving Mercury astronauts will mark the 30th anniversary of the orbital flights of **John Glenn**,

Scott Carpenter and Walter Schirra. [Banke, FLORIDA TODAY, p. 1B, May 8, 1992; Date, THE ORLANDO SENTINEL, May 7, 1992.]

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COLUMBIA: WCS INSTALLED

Columbia's waste containment system (WCS) has been installed in the Orbiter in OPF Bay 3. Work in progress: testing of the communications system; leak checks of the eleven cove seals; crew stowage modification for extended flights; preparations for the Crew Equipment Interface Test of the USML-1 laboratory. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 8, 1992.]

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ATLANTIS: TWO MAIN ENGINES INSTALLED

Main engines No. 1 and 3 have been installed in Atlantis during its processing stay in OPF Bay 1. The waste containment system (WCS) was also installed. Work in progress: installation of the no. 2 engine; installation of getaway special canisters in the payload bay; thermal protection system operations; configuring the aft flight deck for the STS 46 mission. Discovery's modification continues to proceed in OPF Bay 1. Work in progress: structural inspections; thermal protection system operations; X-rays of the freon coolant loop. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 8, 1992.]

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CRANE FAILURE DELAYS DELTA LAUNCH

The Delta 2 launch, already delayed from last Thursday (April 30), will now occur no earlier than May 13. A crane that lifts the rocket's nose cone has failed and must be repaired. "If those repairs go as planned, we should be able to make it," said Anne McCauley, spokeswoman for McDonnell Douglas. ["Crane Failure Delays Delta Liftoff," FLORIDA TODAY, p. 2A, May 9, 1992.]

May 9:

SNOOPY AWARD WINNERS

Kathy Newland and William "Tom" LaChance, both employees of EG&G FLORIDA, Inc., were awarded Silver Snoopys by astronaut David A. Wolf today. Newland operates the KSC automated locator system. LaChance is an engineering support specialist; he received the award for the support he provided EG&G's generator shop for Space Shuttle launches and the NASA Public Affairs office. ["2 KSC Workers Earn Silver Snoopy Awards," FLORIDA TODAY, p. 9E, May 10, 1992.]

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KSC MANAGERS GET NEW JOBS

Robert B. Sieck and Ted Sasseen are getting new jobs today. Sieck has been named Deputy Director of Space Shuttle Management and Operations and will assist Jay Honeycutt in the management and technical direction of the Shuttle Program at Kennedy Space Center. Sieck will continue as Space Shuttle Launch Director. Sasseen was named a special assistant to new KSC Director Robert L. Crippen; he will work on special engineering issues for the Director. Sasseen has been Shuttle engineering director at KSC since 1987. ["Senior KSC Managers Take On New Roles," FLORIDA TODAY, p. 9E, May 10, 1992.]

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LOW TROPHY FINALISTS

McDonnell Douglas Space Systems Co.'s KSC division has been named a finalist in this year's George M. Low Trophy competition. New NASA Administrator **Daniel S. Goldin** said, "I'm a true believer in the George M. Low Trophy process and the TQM philosophy. The award recognizes superior performance by contractors and facilitates the transfer of successful strategies throughout the country. These strategies ensure that quality products and services accommodate our various customers to the highest degree." The trophy will be awarded at the Ninth Annual NASA/Contractor Conference in Pasadena, CA, on October 20.

George M. Low Trophy Finalists - 1992

[1]	McDonnell Douglas Space Systems Co. at Kennedy Space Center
[2]	Cray Research Inc.'s Customer Service, Engineering and Manufacturing Divisions in Chippewa Falls, WI
[3]	Honeywell Inc.'s Space and Strategic Systems Operation in Clearwater, FL
[4]	IBM Federal Sector Division in Houston, TX
[5]	Paramax System Corp.'s Space Systems Operation in Houston, TX
[6]	Rocket Research Co. of Redmond, WA
[7]	Stanford Telecommunications Inc. of Reston, VA
[8]	Technical Analysis Inc. of Houston, Tx

[Halvorson, FLORIDA TODAY, p. 9E, May 10, 1992.]

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NEW FORECASTING TOOLS FOR NASA/AIR FORCE

A six-member team known as the Applied Meteorology Unit has undertaken a three-year effort to originate and improve forecasting tools for Kennedy Space Center and the Cape Canaveral Air Force Station. The unit is operated by NASA contract with ENSCO Inc. (VA) at the 45th Weather Squadron's facilities at the Range Operations Control Center at Cape Canaveral.

APPLIED METEOROLOGY UNIT GOALS

[[1]	Improve the accuracy of the forecast for Shuttle landings at KSC.
[2]	Develop limits for cloud cover and fog during KSC landings.
[3]	Determine how a new Doppler Weather Radar Station (Melbourne, FL) can assist in forecasting prior to launch and vehicle processing operations.
[4]	Evaluate KSC's new lightning detection system.

[Banke, FLORIDA TODAY, p. 9E, May 10, 1992.]

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DELTA LAUNCH READY

The launch of an Indonesian communications satellite aboard a Delta 2 rocket is set for no earlier than May 13 during a window extending from 7:40 to 7:48 p.m. and from 8:29 to 9:47 p.m. The second will be launched no earlier than June 4. Lyle Holloway, Director of Launch Sites for McDonnell Douglas Space Systems Co., said that meeting the target dates was critical. "We're competing in an international marketplace every day," he said. "And it comes down to more than just dollars and cents. It comes down to being able to select a launch date and being credible that we'll make that launch date." [Halvorson, FLORIDA TODAY, May 10, 1992.]

May 11:

COLUMBIA: STS 50 PROCESSING

The Crew Equipment Interface Test of Columbia's Spacelab payload has been completed. Work in progress: testing of the new regenerative carbon dioxide removal system; functional tests of the waste containment system; testing of the communications system; leak checks of the elevon cove seals; crew stowage modification for extended flights. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 11, 1992.]

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ATLANTIS: MAIN ENGINES INSTALLED

All three main engines have been installed in Atlantis during processing activities in OPF Bay 1. Other work in progress: electrically connecting the no. 2 main engine; installation of getaway special canisters in the payload bay; thermal protection system operations; configuring the aft flight deck for the STS 46 mission. Orbiter modifications of Discovery are continuing in OPF Bay 2 along with structural inspections; thermal protection system operations and preparations to service freon coolant loop no. 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 11, 1992.]

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ENDEAVOUR'S BOOSTERS ARRIVE

The solid rocket booster retrieval ships arrived at Hangar AF at 12:30 p.m. Saturday (May 9) and both boosters were in their stands by 4 p.m. The boosters are being prepared for disassembly. Landing of Endeavour is targeted for Edwards Air Force Base (CA) at 7:38 p.m. EDT on Thursday (May 14). [KSC SHUTTLE STATUS REPORT, 10 a.m., May 11, 1992.]

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GOLDIN: NASA MUST BE EFFICIENT

New NASA Administrator Daniel S. Goldin said today that NASA must become more efficient and make choices about which programs to pursue. "NASA," he said, "has a very broad range of things on its plate, and many of the programs that we have don't have a very clearly stated tie to the other programs. And when one has a situation like that, sometimes you can find that maybe we don't have to do everything. If we can get more focused, we'll be much more efficient in our expenditures." Goldin said that NASA managers are currently studying several approaches to running smaller, less expensive programs. "Everything can't be a multibillion-dollar, 10- to 20-year program," Goldin continued. "We have got to start some programs that are an order of magnitude less in cost and have results in three or four years. If I can accomplish one major objective in my tenure as Administrator, it's to get this close coupling (of programs) because I think it will allow us to be much more efficient with the taxpayers' dollars and get results much sooner." Goldin succeeded former Administrator Richard H. Truly on April 1 of this year.

[Halvorson, FLORIDA TODAY, p. 2A, May 12, 1992; Halvorson, USA TODAY, p. 3A, May 12, 1992.]

May 12:

ENDEAVOUR'S BOOSTERS EXAMINED

A preliminary open assessment of the solid rocket boosters indicates they are in good shape following the Endeavour launch. The boosters are being prepared for disassembly at Hangar AF. Today, technicians will conduct hydrolasing operations to remove the exterior foam and cork. Flight planners are laying the groundwork to extend the STS 49 mission by one day for a landing at Edwards Air Force Base (CA) on Friday (May 15). [KSC SHUTTLE STATUS REPORT, 10 a.m., May 12, 1992.]

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COLUMBIA PROCESSING: STS 50

Columbia is being processed for its upcoming STS 50 mission in OPF Bay 3. Work in progress includes: testing of the new regenerative carbon dioxide removal system; functional tests of the waste containment system; testing of the communications system; leak checks of the elevon cove seals; crew stowage modification for extended flights. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 12, 1992.]

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ATLANTIS: GAS CANISTERS INSTALLED

In OPF Bay 1, Get Away Special (GAS) canisters have been installed in Atlantis. Work in progress: electrically connecting the no. 2 main engine; installation of the sleep stations; servicing of the potable water; preparations to test the remote manipulator system. Discovery is being processed in OPF Bay 2. Current activities include: installation of an oxygen tank for the fuel cells; Orbiter modifications; structural inspections; thermal protection system operations; vacuum drying freon coolant loop no. 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 12, 1992.]

May 13:

ENDEAVOUR BOOSTERS' DISASSEMBLY

Endeavour's boosters are being prepared for disassembly at Hangar AF. Hydrolasing activities are continuing to remove the exterior foam and cork. Mission STS 49 is now scheduled to end with a Friday (May 15) landing at Edwards Air Force Base (CA) at 6:37 p.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 13, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., May 14, 1992.]

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COLUMBIA/USML-1 PROCESSING

Processing work currently underway in OPF Bay 3 includes: installation of the four-tier sleep stations; testing of the new regenerative carbon dioxide removal system; crew stowage modification for extended flights; functional tests of the waste containment system; testing of the communications system; leak checks of the elevon cove seals. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 13, 1992.]

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ATLANTIS/DISCOVERY PROCESSING ACTIVITIES

Work in progress on Atlantis (OPF Bay 1): preparations for main engine drying operations; servicing of the potable water; preparations to test the remote manipulator system; testing of connections for the STS 46 payloads. Discovery processing work: installation of an oxygen tank for the fuel cells; Orbiter modifications; structural

inspections; thermal protection system operations; leak checks of the freon coolant loops. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 13, 1992.]

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DELTA 2 LAUNCHED

"I knelt on my knees and thanked God," said Soejud Binwahju, of the Council of Representatives of Indonesia, on witnessing the Delta 2 launch of an Indonesian communications satellite tonight at 8:40 p.m. The payload was a 2,770-pound Palapa B4 spacecraft and is the fourth and last part of Indonesia's satellite network. Thunderclouds in the area threatened to lessen the possibility of launch, but the situation improved in time for the launch during the second available window. [Brown, FLORIDA TODAY, p. 2A, May 13, 1992; Banke, FLORIDA TODAY, p. 8A, May 14, 1992; "Delta Launch Scheduled for Tonight," THE ORLANDO SENTINEL, May 13, 1992.]

May 14:

COLUMBIA: TESTS FOR STS 50

In OPF Bay 3, technicians are preparing Columbia for its upcoming STS 50 mission. These activities include: installation of the four-tier sleep stations; testing of the new regenerative carbon dioxide removal system; crew stowage modification for extended flights; testing of the Ku-band antenna; testing of the communications system; leak checks of the elevon cove seals. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 14, 1992.]

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ATLANTIS: MAIN ENGINES DRIED

Workers in OPF Bay 1 have finished drying the main engines of Atlantis and tests of the remote manipulator system. Work in progress: installing heat shields around the main engines; sampling the potable water; testing of connections for the STS 46 payloads. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 14, 1992.]

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DISCOVERY: MODIFICATIONS IN OPF BAY 2

An oxygen tank for the Orbiter's fuel cells has been installed in Discovery which continues to undergo modifications in OPF Bay 2. Technicians are also making structural inspections, conducting thermal protection system operations and leak checks of the freon coolant loops. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 14, 1992.]

May 15:

STS 50: PROCESSING PROGRESS

In OPF Bay 3, Columbia is being prepared for its upcoming STS 50 mission. Activities include: installation of the four-tier sleep stations; testing of the new regenerative carbon dioxide removal system; crew stowage modification for extended flights; testing of the Ku-band antenna; testing of the communications system; leak checks of the elevon cove seals. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 15, 1992.]

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ATLANTIS AND DISCOVERY: PROCESSING ACTIVITIES

Atlantis is being processed in OPF Bay 1 and current activities include: installing heat shields around the main engines; testing of connections for the STS 46 payloads; servicing the ammonia boiler. Discovery is undergoing modifications and STS 53 processing activities in OPF Bay 2: preparations to power up the Orbiter next week; installation of electronic boxes; installation of the body flap; structural inspections; thermal

protection system operations purging the freon coolant loops. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 15, 1992.]

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ENDEAVOUR TO LAND MAY 16

Endeavour's maiden voyage (STS 49) is now scheduled to end with a landing at Edwards Air Force Base (CA) at 4:57 p.m. EDT tomorrow. The Orbiter's two solid rocket boosters are being prepared for disassembly at Hangar AF. Hydrolasing activities have been completed on both boosters. Both aft skirts and the left nozzle have been removed; the right nozzle is scheduled to be removed today. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 15, 1992.]

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KSC: CONTINGENCY CONTROL CENTER

NASA is considering Kennedy Space Center as a possible site for its planned Emergency Mission Control Center to be activated in the event that Johnson Space Center's Mission Control facilities were shut down due to a hurricane or terrorist activities. Three flight controllers and NASA Flight Director Linda Ham will check out KSC's equipment and practice sending commands to a simulated Orbiter May 19. Shuttle Test Director Al Sofge said that Kennedy Space Center can "give JSC all the visibility into the Orbiter's systems that they need with our current computer programs. The only thing we don't routinely do is to send commands to the Orbiter while it's in the air." He said that part of the reason for moving the center to KSC is that it is unlikely that two hurricanes of such force that would require evacuation of both centers would occur simultaneously. [Banke, FLORIDA TODAY, p. 6A, May 16, 1992.]

May 17:

RETURN TO FLORIDA

Endeavour is being readied in California for its ferry flight to Florida which may begin as soon as May 21. John "Tip" Talone, Endeavour's Processing Director, said of the Orbiter: "It looked pristine, as we think the jewel of the fleet should." Managers are planning to make the return flight in one day if possible. [Brown, FLORIDA TODAY, May 18, 1992.]

May 18:

INTERNATIONAL STEEL CONTRACT

International Steel Industries, Inc. (Orlando, FL) has been awarded a \$333,800 contract to construct a concrete-and-metal storage facility for still and motion picture film that is used to document Space Shuttle payload processing, as well as other Shuttle prelaunch and launch activities, at Kennedy Space Center. [NASA/KSC News Release No. 54-92, May 18, 1992.]

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STS 50: CARGO BAYS CLOSED FOR FLIGHT

The payload bay doors of the Space Shuttle Columbia have been closed in OPF Bay 3 for its upcoming STS 50 mission. Sleep stations have been installed and the Crew Equipment Interface Test with the STS 50 crew has been completed. Work in progress: testing of the new regenerative carbon dioxide removal system; crew stowage modification for extended flights; preparations for tests of the flight control system; structural leak tests of the aft compartment. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 18, 1992; Brown, FLORIDA TODAY, p. 6A, May 19, 1992.]

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STS 46: AMMONIA BOILER SERVICED

The ammonia boilers of Atlantis have been serviced in OPF Bay 1. Other STS 46 processing activities include: installing the IMAX camera; testing the Ku-band antenna; functional testing of the external tank doors; installation of heat shields around the main engines and testing of connections for the STS 46 payloads. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 18, 1992.]

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DISCOVERY: BODY FLAP INSTALLED

Discovery's body flap has been installed during processing activities in OPF Bay 2. Other work in progress includes: preparations to power up the Orbiter this week; installation of electronic boxes; Orbiter modifications; structural inspections; thermal protection system operations; vacuum drying of the freon coolant loops. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 18, 1992.]

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STS 49: LANDING, MISSION SUCCESS

Mission STS 49 ended with a landing of Endeavour on May 16 at Edwards Air Force Base (CA) at 4:57 p.m. EDT. The total mission elapsed time was 8 days, 21 hours, 17 minutes and 38 seconds. Main gear touchdown came at 4:57.38 p.m.; nose gear touchdown was at 4:57.50 p.m.; the drag chute was deployed at 4:57.51 p.m. and the wheels stopped at 4:58.36 p.m. EDT. The total distance Endeavour traveled on its maiden voyage was 3,696,019 statute miles (based on an average altitude of 186 nautical miles). Shuttle Launch Director Robert B. Sieck said, "The vehicle looks as great as the mission it just flew. It's hard to believe it just spent nine days in space." Three finger-sized "gashes" were the only signs of damage to the Orbiter, according to Sieck. Endeavour was towed to the Mate Demate Device later in the day where KSC recovery crews began to prepare the Shuttle for its ferry flight back to Florida. Today, residual cryogenics will be offloaded from the Orbiter's fuel cell storage tanks. Overall preliminary inspections indicate the vehicle is in good condition. Endeavour could be ready for departure from California by May 21; if weather is favorable a one-day ferry flight is possible. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 18, 1992; Halvorson, FLORIDA TODAY, p. 1A-2A, May 17, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-18, May 17, 1992.]

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ENDEAVOUR FERRY FLIGHT

At Edwards Air Force Base (CA), Kennedy Space Center workers are preparing Endeavour for its ferry flight home. John "Tip" Talone, Orbiter Processing Director, said the vehicle returned from its nine-day mission in excellent shape. "It look pristine, as we think the jewel of the fleet should." The ferrying operation is set to begin May 21 and managers plan to make the flight in one day if weather is favorable. A refueling stop is planned for Kelly Air Force Base (San Antonio, TX). KSC's processing facilities are presently occupied by the other three Orbiters: Columbia, Atlantis and Discovery. Columbia is not scheduled to rollover from the OPF to the Vehicle Assembly Building until next week. [Brown, FLORIDA TODAY, p. 1A, May 18, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., May 20, 1992.]

May 19:

INTELSAT K LAUNCH SCHEDULED

Meteorologists predict favorable weather May 20 for the launch of INTELSAT K, the second in a series of telecommunications satellites. "We need something to meet the

growing demand in the Atlantic region until our (next) series of satellites becomes available - particularly with the Summer Olympic games [scheduled for Barcelona, Spain]," said **Sigrid Badenelli**, spokeswoman with the International Telecommunications Satellite Organization. The launch is set to occur between 7:12 and 8:08 p.m. from Cape Canaveral Air Force Station. [Brown, FLORIDA TODAY, p. 6A, May 20, 1992.]

May 20:

COLUMBIA: STS 50 ROLLOVER MAY 27

The transfer of the Space Shuttle Columbia from OPF Bay 3 to the Vehicle Assembly Building is scheduled for May 28 because preparations are taking more time than anticipated. Processing of the Orbiter for its upcoming STS 50 mission includes: testing of the new regenerative carbon dioxide removal system; crew stowage modification for extended flights; tests of the Orbiter's hydraulic systems; nose wheel steering test; installation of auxiliary power unit no. 2. The earliest likely launch of STS 50 will be June 24. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 20, 1992; Banke, FLORIDA TODAY, p. 8A, May 20, 1992.]

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STS 46: INTERFACE VERIFICATION TEST

In Orbiter Processing Facility Bay 1, technicians have completed an interface verification test of Atlantis' IMAX camera. Orbiter processing currently involves the following activities: functional test of the landing gear; testing of the Ku-band antenna; functional testing of the external tank doors; testing of connections for the STS 46 payloads; preparations to close the payload bay doors; closeouts of the midbody and aft compartment. Meanwhile, in OPF Bay 2, workers continue processing and modifying Discovery: powering up operations; installation of electronic boxes; vacuum drying of the freon coolant loops. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 20, 1992.]

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ATLAS 2A LAUNCH TONIGHT

Cape Canaveral Air Force Station was to have been the site of an Atlas 2A launch tonight, but a technical problem scrubbed the mission; it has not been rescheduled. General Dynamics Launch Commentator Jim Codd said the problem appeared to be in plumbing which carries supercold liquid helium through the Centaur to chill the liquid oxygen propellant. There was a related communications problem as well. The Atlas 2 was to have launched an Intelsat K satellite, a companion to the satellite reboosted on Endeavour's recently completed mission. [Banke, FLORIDA TODAY, p. 1A, May 21, 1992.]

May 21:

ENDEAVOUR'S RETURN

Endeavour was bolted the 747 Shuttle Carrier Aircraft early this morning and is ready to begin the cross-country ferry flight back to Florida. Weather conditions are unacceptable between California and Texas for the ferry flight today. Officials will reassess weather conditions tomorrow morning. If weather is acceptable, Endeavour could depart Edwards at 9 a.m. EDT and make a refueling stop along the way. A one-day ferry flight is possible, however the forecast indicates will be a 50 percent chance of having acceptable conditions tomorrow. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 21, 1992; "Endeavour May Head Home Today," FLORIDA TODAY, p. 8A, May 21, 1992.]

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COLUMBIA: NOSE WHEEL TEST COMPLETED

A nose wheel steering test on Columbia has just been completed in OPF Bay 3 in preparation for its June STS 50 mission; the flight control system has also been tested. Work in progress: testing of the new regenerative carbon dioxide removal system; crew stowage modification for extended flights; tests of the Orbiter's hydraulic systems; nose wheel steering test; hooking up the auxiliary power units. Work scheduled: closeouts of the Orbiter's forward and aft compartments; weight and center of gravity determinations May 20 and transfer to the VAB on May 28. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 21, 1992.]

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ATLANTIS/DISCOVERY PROCESSING

In OPF Bay 1, Atlantis is currently undergoing processing operations: tests of the flight control system; tests of the camera on the robot arm elbow; functional test of the landing gear; testing of the Ku-band antenna; functional test of the external tank doors; testing of the connections for the STS 46 payloads; preparations to close the payload bay doors; closeouts of the midbody and aft compartment. Discovery, in OPF Bay 2, reached a milestone in its modification when it was powered up yesterday. Preparations were made to stow the radiators aboard the Orbiter and leak checks of the freon coolant loops were conducted. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 21, 1992.]

May 21:

WEATHER DELAYS ENDEAVOUR RETURN

Stormy weather between Edwards Air Force Base (CA) and Kelly Air Force Base (San Antonio, TX) - Endeavour's refueling stop - delayed the start of the Orbiter's ferry flight to Florida. KSC spokeswoman Lisa Malone said that the trip would begin May 22 if weather permitted. Endeavour, bolted to its Shuttle Carrier Aircraft, should depart Edwards at 9:00 a.m. At Kennedy Space Center, officials said they hoped to have Columbia ready to move from its OPF bay to the Vehicle Assembly Building on May 27. ["Endeavour's Return Delayed," FLORIDA TODAY, p. 6A, May 22, 1992.]

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ATLAS LAUNCH DELAYED A WEEK

A General Dynamics Atlas 2's launch will be delayed until at least early next week. Company spokesman Jim Codd said, "We're looking to get this thing off the ground as soon as we can, but we want to do it safe." Engineers continue to work on a liquid helium pumping system failure. [Banke, FLORIDA TODAY, p. 6A, May 22, 1992; Banke, FLORIDA TODAY, p. 7A, May 28, 1992.]

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EUVE MOVED TO COMPLEX 17

NASA's Extreme Ultraviolet Explorer spacecraft will be moved this evening from the cleanroom facility at Hangar AE to Launch Complex 17 on Cape Canaveral Air Force Station, FL. The move of EUVE, contained in an environmentally controlled canister, is scheduled to begin at 8 p.m. EDT with arrival at Pad 17-A about an hour later. Hoisting of EUVE into the gantry for soft mating atop the Air Force Delta 2 rocket is scheduled for about 10 p.m. EDT. The mechanical hard mate between EUVE and the Delta second stage is scheduled for Friday, May 22. EUVE will then begin approximately 10 days of integrated spacecraft and vehicle testing. Final spacecraft processing was completed the first week of this month. Earlier this week, the spacecraft was integrated with the Delta rocket's payload adapter fitting. EUVE was then prepared for the trip to the launch pad.

Tonight's move culminates the prelaunch processing which began with the spacecraft's arrival from Goddard Space Flight Center (Greenbelt, MD) at the end of January. The Air Force Delta II rocket was erected on Pad A at Complex 17 during the week of April 20 and prelaunch testing and flight preparation of the vehicle has been going smoothly. Encapsulation of the spacecraft in the nose fairing is scheduled to occur on May 29. EUVE is a satellite designed to observe astronomical objects at extreme ultraviolet wavelengths, one of the least-studied portions of the electromagnetic spectrum. The Goddard Space Flight Center manages the project for NASA's Office of Space Science and Applications, Astrophysics Division, Washington, D.C. The launch is targeted to occur on June 4 during a launch window which extends from 12:23 to 1:43 p.m. EDT. [NASA/KSC News Release No. 56-92, May 21, 1992.]

May 22:

LIVINGSTONE GETS NASA POSITION

NASA Administrator **Daniel S. Goldin** today announced the appointment of **Bill Livingstone** as Special Assistant to the Administrator for Communications. "Bill Livingstone, who has worked with the media nationwide, brings to the agency a broad array of experience and talent," Goldin said. "He joins the new team at NASA which is dedicated to making the agency faster, better, cheaper, without compromising safety." For the past 7 years, Livingstone was Press Secretary for then U.S. Senator and now Governor **Pete Wilson** (R-CA). Previously Livingstone was Press Secretary for U.S. Senator **James McClure** (R-Idaho). He also was the Press Secretary for Wilson's gubernatorial election in 1990, and McClure's re-election in 1984. Livingstone was born in Helena, MT. He received a B.S. from Montana State University (honors) and attended graduate school at the University of Southern California in motion picture production and the Fletcher School of Law & Diplomacy in international relations. [NASA/KSC Release No. 92-71, May 22, 1992.]

May 24:

KSC PREPARES GEOTAIL FOR LAUNCH

In July, KSC will launch the Geomagnetic Tail Laboratory aboard a Delta rocket. The Geotail recently arrived at the space center for pre-launch processing. It will be one of three satellites to take part in the Collaborative Solar-Terrestrial Research Program, a planned solar physics study by the United States, Japan and the European Space Agency. **Ken Sizemore**, Project Manager at the Goddard Space Flight Center (Greenbelt, MD), said, "The program concept is to have several spacecraft that really try to look at and understand the relationship between the sun and the Earth." The other missions in the program are the Cluster Mission and the Solar and Heliospheric Observatory Mission. [Brown, FLORIDA TODAY, p. 10E, May 24, 1992.]

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BASE DEVELOPMENT CO. CONTRACT

Star Base Development Co. (Mims, FL) has been awarded a Kennedy Space Center contract, worth \$148,700, to improve water lines running to Launch Complexes 39A and 39B. The contract calls for the addition of 2,700 feet of 18-inch diameter pipeline, along with 600 feet of a smaller-diameter pipeline, to the main KSC water line. ["Mims Firm Wins Contract," FLORIDA TODAY, p. 10E, May 24, 1992.]

May 26:

ENDEAVOUR: WON'T YOU COME HOME?

NASA managers are meeting today at 7 a.m. to decide whether to begin Endeavour's return to Florida aboard the Shuttle Carrier Aircraft. Weather has kept the youngest Orbiter grounded in California. Meanwhile, at Kennedy Space Center, attention is

focusing on the upcoming STS 50 mission of the Space Shuttle Columbia. This will be the first flight of NASA's oldest Orbiter since it was modified at Rockwell's Palmdale, CA, plant. Rollover from the OPF to the VAB is scheduled for midnight May 28. [Banke, FLORIDA TODAY, p. 3A, May 24, 1992; "Weather Keeps Shuttle in California," FLORIDA TODAY, p. 2A, May 25, 1992; Brown, FLORIDA TODAY, p. 1A, May 26, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., May 26, 1992. .]

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COLUMBIA: SYSTEMS CHECKED

The aft compartment and midbody of the Space Shuttle Columbia have been closed in OPF Bay 3 in preparation for its upcoming STS 50 mission. Technicians have also completed checks of tire pressure and pressure checks of the Spacelab. Work in progress: testing of the new regenerative carbon dioxide removal system; crew stowage modification for extended flights and close outs of the Orbiter's crew compartment. Scheduled work: weight and center of gravity determinations beginning tonight and transfer of Columbia to the Vehicle Assembly Building at midnight tomorrow. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 26, 1992.]

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STS 46: ATLANTIS PROCESSING

In OPF Bay 1, technicians processing Atlantis for its STS 46 mission have tested the Orbiter's Ku-band antenna, completed functional tests of the waste containment system and closed out the robot arm for flight. Work in progress includes: cleaning of the payload bay; preparations to close the payload bay doors; closeouts of the midbody and aft compartment. The modification of Discovery in OPF Bay 2 continued. Leak checks of the freon coolant loops and installation of thermal blankets and thermal barriers are in process. A functional test of the Orbiter's radiators has been completed as part of the pre-STs 53 processing. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 26, 1992.]

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NASA RETURNS TO FORMER LOGO

Administrator Daniel S. Goldin issued the following statement today: "Last week as our spirits were lifted by the triumphs of the Endeavour mission, I said, 'The magic is back at NASA.' The can-do spirit of the past is alive and well. In honor of this spirit, it seems only fitting that the original NASA insignia - affectionately known as the 'meatball' - be a part of our future. I know you feel this way, too, because large numbers of you have told me so during my visits to NASA Centers. This does not mean that as of today we will throw away stationary and repaint NASA vehicles. The new NASA will be frugal - finding ways to do everything faster, better and cheaper without compromising safety. That includes this insignia transition. But over time, the NASA symbol of old will replace the current NASA logo. Meanwhile, feel free to order your next set of business cards proudly displaying the blue ball. Take pride in the symbol that stood for NASA excellence in the past - and now - and looks to the world-class NASA of today and tomorrow.

When President Bush charged NASA with the mission of going back to the moon and on to Mars, he said we're going "back to the future." The old NASA insignia is back because the men and women of NASA wanted it back. A classic never goes out of style. On Tuesday at 1:30 p.m. I plan to talk to all of you on NASA Select about the changes that are occurring in our organization and the progress of our NASA program studies. Things are happening quickly, and I regret that it isn't always possible to give adequate notice. But I want you all to know that it is very important to me that you are all included in the

process. [NASA Special Announcement, May 22, 1992; Brown, FLORIDA TODAY, p. 1A, May 27, 1992.]

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NEW NASA CONTINUOUS IMPROVEMENT OFFICE

NASA Administrator Daniel S. Goldin today announced the appointment of Laurie A. Broedling as Associate Administrator for Continuous Improvement. She will report directly to the Administrator and serve as NASA's primary facilitator of Total Quality Management. Broedling's appointment is effective May 26, 1992. "This appointment is an important step in bringing a world-class TQM program to NASA," Administrator Goldin said. "Laurie Broedling has an outstanding background on facilitating TQM and is regarded as an expert in the field." Broedling has had extensive experience leading the implementation of TQM in federal agencies. Before joining NASA, she served in the Department of Defense as Deputy Under Secretary for Total Quality, where she was responsible for overall direction of DoD's implementation of total quality principles and practices. From 1970 to 1989, she was employed by the Department of the Navy, where she held numerous managerial posts. These included serving as the Secretary of the Navy's TQM Technical Advisor, where she created the structure that institutionalized implementation of TQM across the entire Navy and Marine Corps. Broedling also has been a professor at San Diego State University and George Washington University, where she taught graduate and undergraduate courses in strategic planning, organizational behavior and organizational development. She holds a B.A. in psychology from Brown University and an M.A. and Ph.D. in industrial-organizational psychology from George Washington University. [NASA/KSC News Release No. 92-72, May 26, 1992.]

May 27:

STS 50: COLUMBIA POWERED DOWN

Columbia has been powered down in preparation for its rollover from OPF Bay 3 to the Vehicle Assembly Building for the final preparations for its June STS 50. Work in progress: closeouts of the Orbiter's crew compartment; preparations to determine the weight and center of gravity; cycles of the crew module hatch; preparations to mount the Orbiter on the transporter. Work scheduled: transfer of Columbia to the Vehicle Assembly Building tomorrow evening; rollout to Launch Pad 39A June 3; Terminal Countdown Demonstration Test June 8-9; launch in late June. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 27, 1992.]

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STS 46: ATLANTIS PROCESSING ACTIVITIES

Technicians in Orbiter Processing Facility Bay 1 are cleaning Atlantis' payload bay in preparation for closing the bay doors. They are also preparing for closeouts of the vehicle's midbody and aft compartment and are applying protective foaming to closeout the main engines. Rollover to the VAB for mating with its boosters and external tank is scheduled for next week; after five days in the Vehicle Assembly Building, Atlantis will be rolled out to Launch Complex 39B. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 27, 1992.]

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DISCOVERY IN OPF BAY 2

Discovery continues to undergo modification in OPF Bay 2 in preparation for its upcoming STS 53 mission for the Department of Defense. Work in progress: Orbiter systems testing including: power reactant storage and distribution system, main propulsion system and instrumentation system; servicing of the water coolant loop No. 2; installation

of thermal blankets and thermal barriers. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 27, 1992.]

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ENDEAVOUR FERRY FLIGHT

Endeavour departed the Dryden Flight Research Facility this morning at 9 a.m. EDT enroute for Sheppard Air Force Base (Wichita Falls, TX) where the 747 Shuttle Carrier Aircraft will be refueled. If weather permits, the ferry flight will continue to Columbus (MS) where the vehicles will remain overnight. The estimated time of arrival at KSC is 1 p.m. EDT tomorrow (May 28). Weather conditions have been unacceptable between California and Texas for the ferry flight since last Thursday (May 21). Officials will be assessing weather conditions during the ferry flight to determine the best flight path. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 27, 1992; Banke, FLORIDA TODAY, p. 7A, May 28, 1992.]

May 28:

STS 50: ORBITER CREW MODULE CLOSED

Technicians in OPF Bay 3 have closed out the Orbiter crew module in preparation for rolling Columbia over to the Vehicle Assembly Building on May 29. Work in progress: determining the weight and center of gravity and mounting the Orbiter on the transporter. Work scheduled: rollout to Launch Complex 39A on or about June 3; Terminal Countdown Demonstration Test planned for June 8-9; launch in late June. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 28, 1992.]

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STS 46: ATLANTIS PAYLOAD BAY CLEANED

Workers in OPF Bay 1 have finished cleaning the payload bay of Atlantis and are preparing to close the payload bay doors. They are also working to closeout the midbody and aft compartment and applying protective foaming to closeout the main engines. Work scheduled: rollover to the VAB for mating with boosters and external tank next week and rollout to Launch Complex 39B after spending five days in the Vehicle Assembly Building. In OPF Bay 1, workers are verifying the security of the Orbiter's airlock, servicing the water coolant loop No. 2 and processing a number of the vehicle's systems. Modifications to the Orbiter continue. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 28, 1992.]

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ENDEAVOUR FINALLY LEAVES DRYDEN

The Space Shuttle Endeavour finally departed Dryden Flight Research Facility in California yesterday and landed at Biggs Army Air Field (El Paso, TX) where it remained overnight. Officials are assessing the weather conditions to determine the possibility of continuing the ferry flight today. [KSC SHUTTLE STATUS REPORT, 10 a.m., May 28, 1992.]

May 29:

ATLAS LAUNCH SET FOR TONIGHT

General Dynamics Corp. is planning to launch its Atlas rocket tonight between 7:10 and 9:06 EDT. The rocket will carry an Intelsat spacecraft like the one recently reboosted by Endeavour on its maiden voyage. "Every time we have a launch it's a sweaty-palms experience. We get anxious, but we have a lot of confidence in General Dynamics," said Intelsat spokesman Tony Trujillo. A first attempt to launch the Atlas was scrubbed on May 20 due to a problem with the rocket's liquid helium system which is used to chill the upper-stage engines. Tests have proved since that this system is now working properly.

[Banke, FLORIDA TODAY, p. 1A, May 29, 1992; Atlas 2A Rocket Launch Delayed Again," FLORIDA TODAY, p. 5A, May 30, 1992.]

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STS 50: COLUMBIA ROLLS TO VAB

Columbia, having reached a "significant milestone," was rolled over from the OPF to the Vehicle Assembly Building this morning at 8:30 a.m. The STS 50 mission will be the first for Columbia since it underwent extensive modifications at the Rockwell plant in Palmdale, CA. Among the changes were additional fuel storage tanks to allow longer stays in space, a landing drag chute, an improved nosewheel steering system and more powerful brakes. The STS 50 crew will include Commander Richard N. Richards, Pilot Kenneth D. Bowersox, Mission Specialists Bonnie J. Dunbar, Carl J. Meade and Ellen S. Baker, and Payload Specialists Lawrence DeLucas and Eugene Trinh. In the VAB preparations were begun to mate the vehicle to its external tank and solid rocket boosters. Work scheduled: a Shuttle Interface Test to begin at midnight May 30; rollout to Launch Complex 39A is target for 12:01 a.m. June 3; a Terminal Countdown Demonstration Test is set for June 8-9 and launch is aimed at late June. [KSC SHUTTLE STATUS REPORT, 11 a.m., May 29, 1992; Halvorson, FLORIDA TODAY, p. 5A, May 30, 1992.]

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STS 46 PROCESSING

In OPF Bay 1, technicians have closed the payload bay of Atlantis and foamed its main engines in preparation for its upcoming STS 46 mission. Still in progress: closeouts of the midbody; cleaning of the aft compartment; attachment of small doublers on the rudder speed brake over minor corrosion. Atlantis' rollover to the VAB for mating with its booster and external tank is set for next week; rollout will occur after Atlantis has spent five days in the VAB. [KSC SHUTTLE STATUS REPORT, 11 a.m., May 29, 1992.]

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STS 50: DISCOVERY PROCESSING

Discovery continues to undergo modifications and inspections while in OPF Bay 2. Water coolant loop No. 2 is being serviced and systems being tested include the main propulsion system and the instrumentation system. [KSC SHUTTLE STATUS REPORT, 11 a.m., May 29, 1992.]

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ENDEAVOUR MAY RETURN TO CALIFORNIA

If bad weather forces Endeavour to abort its ferry flight to Florida for a return to California it will be another Shuttle era first. The vehicle is left Biggs Army Air Base (El Paso, TX) this morning and flew to Kelly Air Force Base (San Antonio, TX) where it landed at 10:48 a.m. to refuel and assess weather conditions before continuing on to Florida. [Banke, FLORIDA TODAY, p. 4A, May 29, 1992; KSC SHUTTLE STATUS REPORT, 11 a.m., May 29, 1992; Halvorson, FLORIDA TODAY, p. 5A, May 30, 1992.]

May 30:

SPACEPORT USA STAMP CEREMONY

Stamp collectors and the general public today will have the unusual privilege of a second-day-of-issue ceremony in the Galaxy Theatre of Kennedy Space Center's Spaceport USA to purchase and cancel a new set of space stamps honoring U S and Soviet space exploration. This morning's 10 o'clock ceremony will include representatives from both the United States Post Office and KSC will be on hand to welcome everyone and explain the origins behind the stamp. Presentations and speeches will be made by Joe Guthrie,

Director of Marketing and Community Affairs for the Orlando Post Office, **Allen Vaughan**, Supervisor of Mails from the Titusville Post Office, and **Marvin Jones**, KSC Director of Center Support Operations. The first-day-of-issue ceremony will be held at an international stamp exposition in Chicago, IL, in the presence of several Russian dignitaries. According to Vaughan, second-day-of-issue ceremonies rarely occur but Titusville's proximity to the nation's doorway to space also makes it the ideal place to release the new commemorative set of stamps. The cancellation features the Shuttle flying over North America as seen from outer space. These stamps mark the 15th collection commemorating the exploration of outer space. [NASA/KSC News Release No. 57-92, May 28, 1992.]

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ATLAS LAUNCH DELAYED TILL JUNE 2

A problem with its Centaur upper stage has delayed the launch of the General Dynamics Atlas 2A until June 2. The problem is in the system that controls the amount of pressure with the Centaur stage's liquid oxygen tank, according to officials. [Banke, FLORIDA TODAY, p. 7A, May 31, 1992.]

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LSO'S CALIVA WINS EXPERT SYSTEMS AWARD

Lockheed Space Operations Co. employee **Robert Caliva**, along with two other Brevard County computer experts, has won an international computer competition. Caliva and his colleagues are graduate students at the University of Central Florida. "We were very surprised to win. This was an international competition with entries from around the world. It was extremely competitive," Caliva said. The winning entry was a computer systems prototype called KUDOS (Kennedy Switching Data Network User Diagnostic Optimization System; it uses artificial intelligence in aiding computer operators troubleshoot a computer network problem. The KUDOS system is being evaluated for further development and use at Kennedy Space Center. ["Trio Wins Competition," FLORIDA TODAY, p. 9E, May 31, 1992.]

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SMITH WINS SILVER SNOOPY AWARD

USBI Senior Mechanical Engineer **Reid Smith** has been awarded a Silver Snoopy by astronaut **James H. Newman**. He was selected for his work in implementing the Integrated Production Control System at the hangar where Shuttle solid rocket boosters are refurbished following launch. ["USBI Worker Pinned with Silver Snoopy," FLORIDA TODAY, p. 9E, May 31, 1992.]

JUNE

June 1:

DELTA LAUNCH DELAYED, AGAIN

Problems encountered during preparations for liftoff have led to a one-day delay in launching a Delta rocket and its Intelsat payload. The launch window is now set for June 5 between 12:23 p.m. and 1:43 p.m. The problems occurred during the installation of the Delta's nose cone and in testing the small explosive devices which separate the rocket from its nine solid rocket boosters. ["Delta Launch Delayed," FLORIDA TODAY, p. 2A, June 2, 1992.]

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SHUTTLE SHUFFLE TO COMMENCE

The Space Shuttle Columbia will be rolled out for STS 50 to Launch Complex 39A on June 3 and Atlantis will take its place in the VAB to complete preparations for its STS 46 mission. The moves will not occur unless Columbia passes its Shuttle Interface test successfully; that test occurs today. Endeavour, finally returned from California, is in OPF Bay 3 and Discovery is in OPF Bay 2. [Halvorson, FLORIDA TODAY, p. 2A, June 2, 1992.]

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STS 50: ROLLOVER COMPLETED

The Space Shuttle Columbia was transferred May 29 from the Orbiter Processing Facility where it has now been mated with its external tank and solid rocket boosters. A Shuttle Interface Test is underway to verify critical connections between the vehicle elements and the launch platform. In addition, leak checks of the umbilicals between the external tank and Orbiter are being conducted. Rollout to Launch Complex 39A is set for 12:01 a.m. June 3, a TCDT for June 8-9 and launch in late June. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 1, 1992.]

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STS 46: ATLANTIS SET FOR ROLLOVER

The Space Shuttle Atlantis will rollover from OPF Bay 1 to the Vehicle Assembly Building on June 4; at the VAB, the vehicle will be mated with its external tank and solid rocket boosters. Rollout to Launch Complex 39B will come about June 9. In OPF Bay 1, technicians are closing out the midbody and cleaning and closing the aft compartment. They are also attaching small doublers on the rudder speed brake over minor corrosion. Discovery is still undergoing inspections and modifications during its stay in OPF Bay 2; it is also undergoing systems testing and servicing of water coolant loop No. 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 1, 1992.]

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ENDEAVOUR'S ARRIVAL

Endeavour arrived at Kennedy Space Center atop its 747 Shuttle Carrier Aircraft on May 30 at 10:50 a.m. after spending the night at Kelly Air Force Base (San Antonio, TX); the vehicle arrived at OPF Bay 3 at 1:12 a.m. May 31. Work in progress: gaining access to the vehicle and preparations to: open the payload bay doors; position the aerosurfaces and remove the tailcone. Endeavour's next mission is set for September; it will be a seven-day Japanese Spacelab flight. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 1, 1992; Banke, FLORIDA TODAY, p. 1A, May 31, 1992.]

June 2:

STS 50: COLUMBIA PREPARATIONS

Columbia is undergoing a Shuttle Interface Test to verify critical connections between the vehicle elements and the launch platform. Leak checks are also being performed on the umbilicals between the external tank and the Orbiter. Work scheduled: retraction of platforms later this evening; rollout to Launch Complex 39A targeted for 12:01 a.m. tomorrow; Terminal Countdown Demonstration Test planned for June 8-9. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 2, 1992.]

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ATLANTIS: STS 46 PROCESSING

Technicians are topping off the main landing gear tires of Atlantis in OPF Bay 1; they are also cleaning the aft compartment and closing out the midbody and aft compartment. On June 3, the weight and center of gravity of Atlantis will be determined. The vehicle will be rolled over to the VAB on June 4 for mating with its boosters and external tank. Rollout to Launch Complex 39B is set for June 11. A Terminal Countdown Demonstration Test is targeted for June 15-16. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 2, 1992.]

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ENDEAVOUR: TAIL CONE REMOVED

The tail cone, which had been attached to Endeavour for its ferry flight, was removed in OPF Bay 3. Processing activities for its upcoming STS 47 mission included: preparations for the frequency response test; thermal protection system operations; removing ferry flight kit items; preparations to position the aerosurfaces. In OPF Bay 2, Discovery's payload bay door hinges are being inspected and the vehicle's systems are undergoing tests. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 2, 1992.]

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DELTA DELAYED AGAIN

Weather is the villain in today's postponement of the launch of a Delta 2 rocket from Cape Canaveral Air Force Station, according to launch officials. The liftoff has been rescheduled for June 6 between 12:24 to 1:43 p.m. Air Force Meteorologist Captain Ken Warren said, "Weather advisories kept workers off the launch pad most of the day, so they couldn't take care of all their business." ["Weather Forces Another Delay in Delta Liftoff," FLORIDA TODAY, p. 6A, June 3, 1992.]

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COLUMBIA ROLLS TO LC 39A

Columbia began its 3.5 mile trip to Launch Complex 39A with an 11:50 p.m. rollout from the VAB; the trip took six hours. The liftoff of STS 50 is targeted now for June 24. Meanwhile, Atlantis is being readied for a rollover into the Vehicle Assembly Building and subsequent rollout for its STS 46 mission scheduled for mid-July. ["Columbia Moves to Launch Pad 39A," FLORIDA TODAY, p. 6A, June 3, 1992; "NASA Readyng Columbia for Longest Shuttle Flight," THE ORLANDO SENTINEL, June 4, 1992.]

June 3:

STS 50: COLUMBIA HARDDOWN AT PAD

"Columbia is returning to the launch pad for the first time in over a year," announced KSC spokeswoman Lisa Malone. The Space Shuttle Columbia was harddown at Launch Complex 39A at 6 a.m. this morning. The Shuttle Interface Test to verify critical connections between the vehicle elements and the launch platform was completed today

as were leak checks of the umbilicals between the external tank and the Orbiter. Work in progress: moving the rotating service structure around the vehicle; making connections between the launch pad umbilicals and the vehicle; gaining access to various parts of the Orbiter and vehicle; preparations to power up the vehicle. The Terminal Countdown Demonstration Test for the STS 50 mission is scheduled for June 8-9 and launch is targeted for June 24. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 3, 1992; Halvorson, FLORIDA TODAY, p. 1A, June 4, 1992.]

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ATLANTIS: OPF BAY 1 PROCESSING

In OPF Bay 1, technicians topped off the main landing gear tires of Atlantis. Work in progress: structural leak checks; closeouts of the crew module and aft compartment; cleaning of the aft compartment. Work scheduled: weight and center of gravity determination is set for June 4; rollover of Atlantis to the Vehicle Assembly Building for mating with its external tank and solid rocket boosters; rollout to Launch Complex 39B is planned for June 11; the mission TCDT is set for June 15-16. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 3, 1992.]

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ENDEAVOUR AND DISCOVERY PROCESSING

In OPF Bay 3, processing of Endeavour for its second mission - STS 47 - continues: preparations for the frequency response test; thermal protection system operations; removing ferry flight kit items; preparations to open the payload bay doors. In OPF Bay 2, technicians are inspecting Discovery's payload bay door hinges; testing Orbiter systems; inspecting the Orbiter and making modifications and servicing the freon coolant loop No. 1. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 3, 1992.]

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STS 52 EXTERNAL TANK - VAB

The external tank for Mission STS 52, Columbia's flight scheduled this fall with the LAGEOS-2 and USMP-1 payloads, arrived by barge yesterday in the Complex 39 Turn Basin. The tank was transferred into the VAB transfer aisle yesterday afternoon. The tank will be positioned in a checkout cell where it will be prepared for launch. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 3, 1992.]

June 4:

ATLAS THIRD TRY JUNE 8

General Dynamics Corp. will make its third attempt to launch its Atlas 2 rocket on June 8; the payload is an Intelsat satellite like the one recently reboosted by Endeavour's STS 49 mission. The launch window extends from 7:12 p.m. until 9:06 p.m. The two previous delays were due to communications problems with the rocket's Centaur upper stage. ["Atlas Delayed Until Monday," FLORIDA TODAY, p. 6A, June 4, 1992.]

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SPC WORKER DIRECTIVE

This week Lockheed Space Operations's head of security issued a directive requiring security guards to conduct "walk-throughs" of KSC buildings during overnight shifts and on the weekends. The memo directed the security personal: "You will be overt, not clandestine." Lockheed spokesman John Williams said, "We have long-standing procedures, we have internal audits, we have inspections, we have supervision to deal with problems of this type and when rare violations occur, we move as quickly and

effectively as possible to address the problem," he said. "I think that's also a fair statement of our position and I don't really want to elaborate."

Company officials also announced today that LSO might cut up to 250 jobs this summer because of NASA's tight budget. "The job cuts are related to the NASA budget, but in the bigger picture it is part of a streamlining process we're going through to become more efficient," according to Lockheed spokesman J. B. Klump. Already sixty people have accepted early retirement and another forty may depart by the end of the month. [Halvorson, FLORIDA TODAY, p. 4A, June 5, 1992.]

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DELTA HAS TWO CHANCES TO LAUNCH

If weather prevents the launch of an Air Force Delta 2 tomorrow between 12:34 and 1:43 p.m., then a second attempt on Sunday is possible, according to Lt. Col. Randy Moyer, Commander of the 1st Space Launch Squadron, at Patrick Air Force Base. If the Delta launch is delayed until Sunday (June 7), then the upcoming commercial Atlas 2 launch may be delayed until June 9. Moyer said that under informal Eastern Test Range rules, a rocket will be given two consecutive days to launch before having to wait for the next booster scheduled. [Banke, FLORIDA TODAY, p. 4A, June 5, 1992.]

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STS 50: COLUMBIA AT LC 39A

The rotating service structure around Columbia has been completely moved by 9:30 a.m. today. Work in progress: making connections between the launch pad umbilicals and the vehicle; electrical checks of the auxiliary power units. Work scheduled: TCDT targeted for June 8-9; Flight Readiness Review set for June 9; late June launch date. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 4, 1992; NASA/KSC News Release No. 51-92, June 4, 1992.]

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STS 46: CENTER OF GRAVITY DETERMINED

In Orbiter Processing Facility Bay 1, the weight and center of gravity of Atlantis has been determined in preparation for the Shuttle's upcoming STS 46 flight. Work in progress: preparations to tow the Orbiter to the Vehicle Assembly Building by midday; inspections of the landing gears. Work scheduled: mating with its boosters and external tank the night of June 5; rollout to LC 39B set for June 11; TCDT set for June 15-16. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 4, 1992; "Atlantis to be Fitted Today With Boosters, External Tank," FLORIDA TODAY, p. 4A, June 5, 1992.]

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ENDEAVOUR/DISCOVERY PROCESSING

Technicians in OPF Bay 3 have completed a test of Endeavour's flight controls and are working on the following items: thermal protection system operations; removing ferry flight kit items; preparations to open the Orbiter's payload bay doors. Discovery is in OPF Bay 2 where it is continuing to undergo extensive modifications and structural inspections. Systems testing continues as do inspections of the payload bay door hinges and servicing of the freon coolant loop no. 1. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 4, 1992.]

June 5:

STS 50: UMBILICALS CONNECTED

Workers at Launch Complex 39A have connected launch pad umbilicals to the vehicle elements of Columbia. Pad processing for STS 50 includes: preparations for the main engine flight readiness test in which the valves will be cycled and sensors will be calibrated; preparations to load hypergolic propellants into the Orbiter; circulating and sampling the hydraulic fluid; connections of the auxiliary power units. Work scheduled: helium signature leak test (June 8); TCDT for June 8-9; Flight Readiness Review (June 9); launch targeted for late June. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 5, 1992.]

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ATLANTIS IN VAB FOR STS 46 PREPS

Atlantis was towed from the Orbiter Processing Facility yesterday and was inside the VAB by 6:30 p.m. Today Atlantis was mated with its external tank and solid rocket boosters for its STS 46 mission. Scheduled work includes a rollout to Launch Complex 39B on June 11 and a TCDT for June 15-16. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 5, 1992.]

June 6:

DELTA II/EUVE SCRUB

Today's launch of the Delta II/EUVE mission was postponed at NASA's request because they could not maintain effective communication between the EUVE spacecraft and Goddard Space Flight Center. The postponement announcement came at 12:30 p.m. EDT. According to Goddard: The spacecraft team could not confirm today that they had proper flight data on the spacecraft. The depth of testing needed to troubleshoot this problem could not be done in the launch configuration. Therefore, it was decided to stand down today because there was insufficient time left in the launch window to do the proper troubleshooting. The team also wanted to provide the maximum time to be ready for a launch tomorrow. When the launch was postponed, the Eastern Range was "red" because an Air Force tracking radar at Antigua was down and was being evaluated. The exact nature of the problem with the radar had not been determined when the launch was scrubbed. Also, weather conditions were unacceptable starting at 3 minutes into the launch window due to the presence of active thunderstorm anvil (electrically charged) clouds within 10 nautical miles of the launch site, which is a triggered lightning concern. The launch has been rescheduled for Sunday (June 7) between 12:24 and 1:43 p.m. EDT. [Joint USAF/NASA Statement on Delta II/EUVE Launch Scrub, June 6, 1992; "Problems Cause Delay Of A Satellite Mission," THE NEW YORK TIMES, p. 15A, June 6, 1992; "Storms, Technical Glitches Delay Delta Rocket Launch," THE ORLANDO SENTINEL, June 7, 1992.]

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ENDEAVOUR AND DISCOVERY

Endeavour processing STS 47 activities include: preparations to remove the forward reaction control system and to offload residual hypergolic propellants; troubleshooting the Ku-band antenna; post-flight inspections of the thermal protection system; opening of the payload doors. Discovery continues to undergo modifications for STS 53 in OPF Bay 2. In addition technicians are doing Orbiter systems testing including the main propulsion system, fuel cells and vacuum drying freon coolant loop No. 1. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 5, 1992.]

June 7:

DELTA DOES IT

The frequently delayed Delta 2 mission to launch the Extreme Ultraviolet Explorer Spacecraft finally lifted off from Cape Canaveral Air Force Station at 12:40 p.m. Scientists will not know for two to three weeks whether the Extreme Ultraviolet Explorer is working properly; the EUVE was deployed successfully 71 minutes after the Delta lifted off. Even this launch was again delayed, for three minutes, to avoid a collision with the Mir, the Russian space station. The launch was the 32nd consecutive successful Delta flight since 1986; it was purchased from the Air Force by NASA for \$46 million. The Delta was originally built to launch a Global Positioning Satellite (NAVSTAR) for the military. [Date, THE ORLANDO SENTINEL, p. A-3, June 8, 1992; "Satellite Launched to Observe Ultraviolet Radiation of Stars," THE NEW YORK TIMES, p. A9, June 8, 1992; Brown, FLORIDA TODAY, p. 2A, June 8, 1992; MISSION STATUS REPORT: NASA'S EXTREME ULTRAVIOLET EXPLORER (EUVE), June 9, 1992.]

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STS 50 CREW ARRIVES FOR TCDT

The STS 50 crew arrived at Kennedy Space Center today to participate in the mission's Terminal Countdown Demonstration Test. At the traditional arrival press conference, Commander Richard N. Richards said, "Well, thanks for coming out, I understand there's some competition today and quite frankly that's where we're going to," referring to the upcoming Delta launch. "It's great to always see a spaceflight - even if it's an unmanned spaceflight. It's a thrill to see it all." The crew will attend briefings about the status of launch preparations; learn how to escape complex 39A during an emergency; participate in a two-day practice countdown, which begins at 8 a.m. today. The STS 50 crew also includes Pilot Kenneth D. Bowersox, Payload Commander Bonnie J. Dunbar, Payload Specialists Lawrence DeLucas and Eugene Trinh and Mission Specialists Carl J. Meade and Ellen S. Baker. Astronauts Joe Pahl and Al Sacco are alternates for STS 50. Launch of the 48th Shuttle mission is set for no earlier than June 25. [Hall, FLORIDA TODAY, p. 2A, June 8, 1992; Halvorson, FLORIDA TODAY, p. 1A, June 9, 1992.]

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SMITH WINS SNOOPY

USBI Senior Mechanical Engineer Reid Smith has been awarded a Silver Snoopy by astronaut James H. Newman. Smith was chosen for his work in implementing the Integrated Production Control System at the hangar where solid rocket boosters are returned for refurbishing after launch. The system tracks more than 2000 rocket booster parts. ["USBI Worker Pinned With Silver Snoopy," FLORIDA TODAY, p. 9E, June 7, 1992.]

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GOLDIN APPOINTS BROEDLING & LIVINGSTONE

Laurie Broedling has been appointed by NASA Administrator Daniel S. Goldin to be Continuous Improvement Office Administrator. Goldin also tapped Bill Livingstone to be Special Assistant to the Administrator for Communications. ["Goldin Taps Two to New Posts," FLORIDA TODAY, p. 9E, June 7, 1992.]

June 8:

STS 50: FRC SYSTEM CHECKS

At Launch Complex 39A, technicians have completed Forward Reaction Control System quick disconnect leak checks; a Flight Readiness Test of the main engines and auxiliary power unit exhaust checks and lube oil servicing. Work in progress: helium signature leak checks; TCDT (call to stations at 8:00 a.m.); pre-launch propellant load preparations.

Work scheduled: TCDT set for 11 o'clock June 9; Flight Readiness Review today and tomorrow; pre-launch propellant loads; auxiliary power unit hot fire. [KSC SHUTTLE STATUS REPORT, 10 a.m, June 8, 1992.]

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ATLANTIS: MATING TO ET & SRBS

In the VAB, Atlantis has been mated to its external tank and its solid rocket boosters. Work in progress: Shuttle Interface Verification test; external tank and solid rocket booster closeouts. Rollout to Launch Complex 39B is set for 12:01 a.m. June 11. [KSC SHUTTLE STATUS REPORT, 10 a.m, June 8, 1992.]

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DISCOVERY: FUEL CELL TEST COMPLETED

Technicians have completed a fuel cell single volt test on Discovery in OPF Bay 2. Work in progress: Orbiter electrical system validations checks; water spray boiler leak and functional tests and freon coolant loop servicing. [KSC SHUTTLE STATUS REPORT, 10 a.m, June 8, 1992.]

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ENDEAVOUR: WASTE CONTAINMENT SYSTEM REMOVED

Technicians have removed Endeavour's waste containment system and cycled and checked the payload bay doors. They also drained the APU catch bottle. Work in progress: ball valve leak checks; Ku-antenna function tests; cargo downloading; chin panel removal; helium tank venting; Reaction Control System pod thruster inspections. [KSC SHUTTLE STATUS REPORT, 10 a.m, June 8, 1992.]

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KSC CONSOLIDATION PLAN KILLED

NASA has killed a plan under which all top Shuttle managers would have been transferred to Kennedy Space Center. A new proposal would have only 10 engineers from Johnson Space Center move to KSC. "Based on the things (Shuttle Program Director Leonard S. Nicholson) saw as important for him to be involved in, he felt those responsibilities would be better served with his being at JSC," said Nicholson's deputy Brewster H. Shaw, Jr., a former astronaut. Bob Allen, Executive Director of the Space Coast Economic Development Commission (Titusville, FL) said, "We were getting all the signals - right up until the ax fell - that this (consolidation) plan went right along with a leaner, meaner, tighter NASA. We're disappointed, but we're not giving up. We're going to keep working with NASA to point out that there are advantages in locating these positions at KSC." [Brown, FLORIDA TODAY, p. 1A, June 9, 1992.]

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VAB MODIFICATIONS CONTRACT

International Steel, Inc. (Orlando, FL) has been awarded a \$6,644,820 contract to modify High Bays 1 and 3 in the Vehicle Assembly Building, provide additional clearance height to the facility's north transfer aisle door, add girder reinforcement to support new overhead cranes, and build an interior platform to provide access to and catch debris from the roof of the building. As part of another contract, two new 325-ton overhead cranes will be added to the VAB superstructure to lift the heavier ASRM segments into the VAB high bays. International Steel will, provide the reinforcement to the overhead VAB superstructure to support the new cranes. [NASA/KSC News Release No. 63-92, June 8, 1992.]

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WATSON PAVING CONTRACT

Watson Paving, Inc. (Cocoa, FL) has been awarded a \$2,206, 742 fixed price contract to restore and pave the shoulders of the Shuttle Landing Facility (SLF) runway at Kennedy Space Center and to reposition and upgrade part of its lighting system. Other work includes the replacement of the original runway edge lights that were installed in 1975 and the electrical transformer that provides their power. The new lights will mark the original 300-foot-wide concrete runway, while the asphalt-paved shoulders will extend 50 feet beyond the lights on each side. The lights are amber for the first 2,000 feet at each end and white in the middle section. [NASA/KSC Release No. 62-92, June 8, 1992.]

June 8:

COLUMBIA TO LAUNCH JUNE 25

NASA will launch the Space Shuttle Columbia on a 13-day mission on June 25, 1992. NASA officials selected the launch date at the conclusion of the Flight Readiness Review held today at the Kennedy Space Center, FL. Mission STS 50, planned to be the longest flight to date in the Shuttle Program, will carry the United States Microgravity Laboratory-1 payload into orbit. A Spacelab long module will serve as an in-orbit laboratory for seven crew members and 31 experiments devoted to materials science, fluid physics, combustion science and technology. Columbia will be launched into a 184 statute mile circular orbit inclined 28.5 degrees to the Equator from Launch Complex 39A. The launch window on June 25 opens at 12:07 p.m. EDT and closes at 2:37 p.m. EDT. Columbia will end its mission with a landing at Dryden Flight Research Facility, CA. The mission duration is planned for 12 days, 20 hours and 29 minutes. Commanding the mission will be Richard N. Richards. Columbia's pilot will be Kenneth D. Bowersox. Mission Specialists are Bonnie J. Dunbar, Ellen S. Baker, and Carl J. Meade. Payload Specialists are Larry DeLucas and Eugene Trinh. [STS-50 Launch Advisory, June 9, 1992.]

June 9:

TCDT COMPLETED: STS 50

At Launch Complex 39A, technicians and the STS 50 crew have completed the Terminal Countdown Demonstration Test (TCDT). Other tasks completed at the pad: helium signature leak checks; Flight Readiness Test of the main engines; Auxiliary Power Unit exhaust checks and lube oil servicing. Work in progress: Mission Manager's Flight Readiness Review; pre-launch propellant load preparations; closeouts for Auxiliary Power Unit hot fire; Inertial Measurement Unit calibrations. Work scheduled: pre-launch propellant loads and Auxiliary Power Unit hot fire. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., June 9, 1992.]

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ATLANTIS: MATING COMPLETED

In the Vehicle Assembly Building, workers completed the mating of Atlantis to its external tank and its solid rocket boosters. Work in progress: shuttle interface verification test; main propulsion system tests; Orbiter and external tank mate closeouts. Rollout for the STS 46 mission is scheduled for 12:01 a.m. June 11. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., June 9, 1992.]

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ENDEAVOUR: PAYLOAD DOWNLOADING

In Orbiter Processing Facility Bay 3, technicians have completed downloading Endeavour's payload. The auxiliary power unit catch bottle has been drained and the payload bay doors cycled and checked. Work in progress: ball valve leak checks; Ku-

antenna function tests; waste containment system drain and flush; main engine test shield removal; reaction control system pod thruster inspections. The forward reaction control system has been removed from the Orbiter. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., June 9, 1992.]

DISCOVERY: COOLANT LOOP SERVICED

In OPF Bay 2, Discovery's freon coolant loop servicing is complete to date and the fuel cell single volt test has been finished. Technicians are making Orbiter electrical system validations checks and water spray boiler leak and functional tests. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., June 9, 1992.]

DISCOVERY FLOW DIRECTOR NAMED

Kennedy Space Center has named David A. King as Flow Director for the Space Shuttle Discovery. King joins three other flow directors at KSC who oversee the work performed on the Shuttles Endeavour, Atlantis and Columbia. "David's keen sense of responsibility coupled with his bright and energetic attitude are essential ingredients for a good flow director and he is an asset to the team," said Jim Harrington, Director of Shuttle Operations.

As flow director, King is responsible for the overall management of all government and contractor activities associated with processing the Orbiter for each of its assigned missions. Responsibilities extend to all areas of flight hardware processing to assure timely achievement of schedule milestones. King began his career with NASA in 1983 as a Shuttle main propulsion system engineer, a position he held for six years before becoming vehicle manager for the Orbiters' Discovery and, subsequently, Endeavour. As vehicle manager, he was responsible for the daily activities of Orbiter testing and processing. He held this position for the past two years until being named as flow director.

"I am excited about the challenges of being a flow director and taking a more active role in managing the overall operation of getting an Orbiter ready for flight. My previous experience as a vehicle manager and as a systems engineer will be invaluable for me on this job," said King. Discovery is currently undergoing a modification and improvement period. Its next flight, Mission STS 53 which is a Department of Defense mission, is tentatively planned for this fall. [NASA/KSC News Release No. 65-92, June 9, 1992; "NASA Appoints King As Discovery's New Boss," FLORIDA TODAY, p. 9E, June 14, 1992.]

June 10: ATLANTIS ROLLOUT TONIGHT

Technicians have completed: a Shuttle interface verification test; Shuttle interface stray voltage tests and the main propulsion system tests. Work in progress: Orbiter and external tank mate final closeouts and preparations to retract work platforms. Work scheduled: rollout to Launch Complex 39B set for 12:01 a.m. June 11 and the STS 46 Terminal Countdown Demonstration Test (TCDT) has been scheduled for June 16. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 10, 1992.]

UTSMAN: SHUTTLE PROGRAM DIRECTOR

NASA Associate administrator for Space Flight Jeremiah W. Pearson, III, today announced that Thomas Utsman, currently Deputy Associate Administrator, Office of Space Flight, will

become the Program Director for the Space Shuttle. He will be given responsibility for directing long-range Shuttle planning, Space Shuttle continuous improvement activities and overseeing efforts to reduce Shuttle operations costs while maintaining safety. Program Manager, Space Shuttle, Leonard S. Nicholson will remain at the Johnson Space Center (Houston, TX) where he will oversee the day to day management of the Space Shuttle Program and the integration of the Shuttle and Space Station Freedom. Management of vehicle integration and launch processing will continue to be the responsibility of Nicholson's deputy, Brewster H. Shaw, Jr., at the Kennedy Space Center, FL

"One of the main challenges for the Shuttle Director's office in the coming years will be to oversee the integration of the Shuttle and Space Station Freedom," said Pearson. "In light of that, it will be more efficient for the Director to be at JSC where personnel reside who are responsible for the mission operations for both Shuttle and Station, as well as engineering and design support for both programs." Freedom will be carried up in 18 separate stages aboard the Space Shuttle and assembled in space. Assembly of the orbiting international research center will begin in late 1995. Previously, the relocation of the Shuttle Program Director from NASA Headquarters to KSC required the transfer of some program management functions and would have involved the relocation of approximately 20 people. Under this revised organization, a limited set of functions will be transferred to support the Program Manager in the areas of configuration and data requirements, ground operations and project integration support will involve approximately 10 people being relocated to KSC. [NASA/KSC News Release No. 92-83, June 10, 1992; "Utsman Takes Control in Shuttle Reorganization," FLORIDA TODAY, p. 9E, June 14, 1992.]

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STS 50: FRR COMPLETED

STS 50's Flight Readiness Review has been completed at Kennedy Space Center; mission managers have set the launch for June 25 and the window extending from 12:07 p.m. till 2:37 p.m. EDT. The Terminal Countdown Demonstration Test has been completed as have the Inertial Measurement Unit calibrations. Work in progress: pre-launch hypergolic propellant load and closeouts for auxiliary power unit hot fire. Work scheduled: auxiliary power hot fire; special cryogenic confidence tanking test of the Extended Duration Orbiter (EDO) pallet. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 10, 1992; Date, THE ORLANDO SENTINEL, June 10, 1992.]

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STS 47: ENDEAVOUR PROCESSING

In OPF Bay 3, technicians have completed Orbiter power system validations; payload downloading and chin panel removal. Work in progress: removal of forward reaction control system; Ku-antenna function tests; waste containment system drain and flush; main engine heat shield removal; reaction control system pod thruster inspections; ball valve leak checks. Work scheduled: transport FRCS to hypergolic maintenance facility and ammonia boiler purge and drain. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 10, 1992.]

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STS 53: DISCOVERY PROCESSING

Freon coolant loop servicing on Discovery is complete to date and the fuel cell single volt test is finished. Work in progress: Orbiter electrical system validations checks; water spray boiler leak and functional tests; main propulsion system leak and functional test and

power reactant and storage distribution system tests. Work scheduled: auxiliary power unit lube oil and hot oil flush and internal and external lightning subsystem verification. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 10, 1992.]

June 11:

COLUMBIA AT LC 39A

At LC 39A Columbia's TCDT has been finished as have the inertial measurement unit calibrations. Work in progress: pre-launch hypergolic propellant load with the pad closed to non-essential personnel; closeouts for auxiliary power unit hot fire scheduled for June 12. A special cryogenic confidence tanking test of the Extended Duration Orbiter pallet is set for June 15. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 10, 1992.]

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ATLANTIS ROLLS OUT TO LC 39B

First rollout motion of Atlantis occurred at 11:54 p.m. last night and the Orbiter was hard down on the pad at 7:16 a.m. this morning. A Shuttle interface verification test and Orbiter tank and external tank mate final closeouts have been completed. Work in progress: pad validations; rotation of service structure around the vehicle; procedures to power-up the vehicle. The Terminal Countdown Demonstration Test for the STS 46 mission is scheduled for June 16; the crew will arrive at KSC late June 20. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 10, 1992.]

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STS 47: ENDEAVOUR PROCESSING

Endeavour's Forward Reaction Control System has been completed in OPF Bay 3; Orbiter power system validations are finished and the Orbiter's waste containment system has been drained and flushed. Work in progress: ammonia boiler purge and drain; Ku-antenna functional tests; main engine heat shield removal; reaction control system pod thruster inspections; SRB stacking operations in the Vehicle Assembly Building. The transport of the forward reaction control system to the hypergolic maintenance facility has been scheduled. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 10, 1992.]

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DISCOVERY: STS 53 PROCESSING

Processing activities on Discovery for its upcoming STS 53 mission continue in OPF Bay 2: Orbiter electrical system validation checks; water spray boiler leak and functional tests; main propulsion system leak and functional test; power reactant and storage distribution system tests. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 10, 1992.]

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GOLDIN ORDERS SAFETY REVIEW

NASA Administrator Daniel S. Goldin has ordered Shuttle managers to review safety aspects of Atlantis' STS 46 mission; the review is not expected to delay the launch scheduled for July. A number of panels and boards have expressed concern about the tethered satellite Atlantis will deploy on STS 46; they fear that the satellite could smash into the Orbiter as it is reeled back into the cargo bay. Astronaut Jeffrey A. Hoffman said, "The initial reaction that most people have when they learn that we are about to attach the Shuttle to a satellite by a rope is something like 'Oh my god, why would anybody want to do that?'" He said that the satellite has been developed to discover new ideas for propulsion, generating electricity, creating artificial gravity and study Earth's upper atmosphere from orbit. Hoffman added, "We feel extremely confident that we have addressed adequately all the safety concerns." The target date for the launch is July 16

and the crew includes: Commander Loren J. Shriver, Pilot Andrew M. Allen, Mission Specialists Franklin R. Chang-Diaz, Marsha S. Ivins, Claude Nicollier of the European Space Agency and Italy's Franco Malerba. [Banke, FLORIDA TODAY, p. 1A, June 12, 1992.]

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KSC REDUCES NIGHT SHIFT

Kennedy Space Center announced today that it would reduce the number of employees on its third shift, described as highly paid and less productive than the first and second shifts. "It's a productivity issue," said Robert B. Sieck, Deputy Director of Shuttle Management and Operations. "The way we're set up to do business, we're more productive on a two-shift, five-days-a-week basis." That kind of work schedule had been a goal of former KSC Director Forrest S. McCartney who said, "That's the way it ought to be. I never liked the odd work week. People work better on first and second shift - I don't care what kind of job you have." Sieck said the cutbacks are unrelated to the recent reports that "overnight workers at KSC were wasting time talking on the phone, reading books and sleeping on the job." Sieck also said that 700 workers are employed on the graveyard shift and that number would probably never be reduced to zero. He said that some tasks, such as hazardous operations or waterproofing Shuttle tiles, are better to schedule with fewer people around. [Brown, FLORIDA TODAY, p. 4A, June 12, 1992.]

June 12:

EDO TANKING TEST PLANNED

Engineers at Kennedy Space Center will conduct a special cryogenic tanking test of the Extended Duration Orbiter (EDO) tanks located on the EDO pallet inside the payload bay of the Shuttle Columbia; the test is scheduled for June 15 at Launch Complex 39A. The cryogenic confidence test of the EDO tanks is designed to provide the sequence of operations required to prepare the Shuttle for launch on its record-breaking 13-day mission later this month. The test will also allow engineers the opportunity to evaluate EDO loading and detanking techniques and procedures and provide data necessary to develop accurate time lines for Power Reactant Storage and Distribution (PRSD) system servicing during the launch countdown.

Columbia's mission, featuring the United States Microgravity Laboratory-1, will require the additional cryogenic consumables to allow the crew and vehicle to remain in orbit for the planned 13 days. The EDO tanks are located in the aft end of Columbia's payload bay on a special EDO pallet. There are eight tanks on the pallet, four for liquid hydrogen and four for liquid oxygen. Each tank has been individually tested, but not as an integrated system. These extra tanks will complement the four sets of Orbiter PRSD tanks already mounted under the lining of the Orbiter's payload bay. During June 15's confidence test, engineers will use essentially the same procedure used during a launch countdown. The EDO tanks will be filled first, followed by the loading of the original Orbiter PRSD tanks. Liquid oxygen tanking operations will occur first. After stabilization, engineers will proceed with liquid hydrogen tanking operations. Each of the eight EDO tanks have independent isolation valves. As each tank fills, these valves will be cycled to give test team members an opportunity to pressurize and leak check the various tanks and associated fill and drain lines.

When all of the tanks are at flight pressure and stabilized, further evaluations will be made. Detanking will follow on the same day. These onboard circular cryogenic tanks supply the Orbiter's fuel cells which, in turn, produce electrical power for the Shuttle

during flight. The by-product of combining the liquid hydrogen and liquid oxygen reactants is drinking water for the crew. The addition of the EDO tanks and pallet was part of the extensive modifications made to the Shuttle Columbia over the past year. The extra tanks will permit the vehicle to remain safely in orbit for up to 16 days. [NASA/KSC News Release No. 72-92, June 12, 1992.]

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STS 50: COLUMBIA FUELING OPERATIONS

Fueling operations for pre-launch hypergolic propellant loads have been completed at Launch Complex 39A. Other work in progress prior to the launch of Columbia on its STS 50 mission: pre-launch hypergolic propellant load with the pad closed to non-essential personnel; closeouts for auxiliary power unit hot firing scheduled for early on June 13. Scheduled work: retracting the rotating service structure from around the vehicle; auxiliary power unit hot firing; special cryogenic confidence tanking test of the Extended Duration Orbiter pallet set for June 15; checkout of the regenerable CO² removal system (RCRS) controllers and actuators; launch set for 12:07 p.m. EDT, June 25. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 12, 1992.]

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ATLANTIS: STS 46 AT LC 39B

At Launch Complex 39B, Atlantis has had the rotating service structure moved around the vehicle; procedures were undertaken to power-up the vehicle and the Shuttle Interface Verification test was completed. Work in progress: launch pad validations; Orbiter hydraulic operations; preparations for the mission's Terminal Countdown Demonstration Test (TCDT). The TCDT is scheduled for June 16 and the crew is expected to arrive on June 14. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 12, 1992.]

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OPF BAY 3: ENDEAVOUR PROCESSING

In OPF Bay 3, technicians have completed mass memory unit loads into Endeavour's computers. Other completed work includes: ammonia boiler purge and drain; reaction control system pod thruster inspections; removal of forward reaction control system; waste containment system drain and flush; Orbiter power system validations. Work in progress: Ku-band antenna functional tests; 17-inch disconnect inspections; main engine heat shield removal; preparations for removal of main engines; SRB stacking operations in Vehicle Assembly Building; transport forward reaction control system to hypergolic maintenance facility. Scheduled work includes main engine removal and payload bay radiator inspections. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 12, 1992.]

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DISCOVERY: OPF BAY 2 PROCESSING

In OPF Bay 2, Discovery's freon coolant loop has been serviced and an auxiliary power unit lube oil and hot oil flush has been conducted. Work in progress: Orbiter electrical system validations checks; water spray boiler leak and functional tests; main propulsion system leak and functional test; power reactant and storage distribution system tests. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 12, 1992.]

June 14:

STS 46 CREW ARRIVES AT KSC

The seven-member crew of STS 46 arrived at Kennedy Space Center today to attend briefings, participate in a Terminal Countdown Demonstration Test and to learn how to

escape Launch Complex 39B in the event of an emergency. KSC spokesman Bruce Buckingham said that "everything is still on schedule" for a June 25 launch of Atlantis. The crew of STS 46 includes Commander Loren J. Shriver, Pilot Andrew M. Allen and Mission and Payload Specialists Jeffrey A. Hoffman, Franklin R. Chang-Diaz, Claude Nicollier, Marsha S. Mins and Franco Malerba. Meanwhile, workers at Launch Complex 39A are preparing Columbia for its STS 50 mission by loading toxic rocket propellant aboard the Orbiter and testing its three auxiliary power units. Tomorrow, workers will test tanks in the cargo bay by filling them with liquid oxygen and liquid hydrogen. [Banke, FLORIDA TODAY, p. 1A, June 14, 1992.]

June 15:

STS 50: JUNE 25 LAUNCH DAY

The Space Shuttle Columbia will launch its STS 50 mission on June 25; that was the decision of the just completed Flight Readiness Review held at Kennedy Space Center. A paperwork review documenting Columbia's assembly process relieved concerns of launch officials that a turbopump was cracked. Concerns remain about a turbopump attached to one of Atlantis' three main engines. The launch of Atlantis' STS 46 mission may be delayed from July 16 if the suspect pump must be replaced. [Banke, FLORIDA TODAY, p. 1A, June 16, 1992; SEE "EDO Test Completed: STS 50" below.]

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LOGO CHANGE OPPOSED BY NEA DIRECTOR

National Endowment for the Arts Director **Mina Wright Berryman** thinks that NASA Administrator **Daniel S. Goldin's** desire to return to using the old "meatball" logo for the agency is a bad idea. Ms. Berryman said, "The worm [current NASA logo] is not simply a logo but an integral part of NASA's comprehensive visual standards program." She cited the agency's winning of a presidential award for design excellence in 1984. Goldin has not directed that current uses of the worm be excised, but rather that the return to the "worm" be phased in. NASA officials said that repainting the Shuttles would cost \$400,000 per Orbiter. ["NASA Logo Change Sends Some Workers Into Orbit," THE ORLANDO SENTINEL, June 16, 1992.]

June 16:

EDO TEST COMPLETED: STS 50

At Launch Complex 39A, technicians have completed their Extended Duration Orbiter cryogenic confidence test; the auxiliary power unit hot firing and the pre-launch hypergolic propellant load. Work in progress: checkout of the regenerable CO₂ removal system (RCRS) controllers and actuators; auxiliary power unit closeouts; cavity purge and leak checks and launch countdown preparations. Ordnance installations and hypergolic fuel pressurization have been scheduled. Engineers concluded yesterday that there is no concern for a "tip" seal on the high pressure oxidizer turbopump on Columbia's main engine number three. Documentation revealed the seal had been removed and fully inspected prior to being installed on the pump. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 16, 1992.]

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STS 46: LAUNCH PAD VALIDATIONS

At Launch Complex 39B, technicians have completed launch pad validations; they have opened the payload bay doors and completed Orbiter hydraulic operations. Work in progress: terminal countdown demonstration test (TCDT) set for 11:00 a.m.; rudder speed brake bondings; preparations for auxiliary power unit pre-launch propellant servicing. Work scheduled: pre-launch propellant loading operations; inertial

measurement unit calibrations; helium signature test. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 16, 1992.]

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ENDEAVOUR: SPACELAB INTERFACE TESTS

In OPF Bay 3, technicians and the crew of STS 47 - Endeavour's next mission - have completed Spacelab equipment interface tests, window inspections, reaction control system pod thruster inspections and Orbiter power system validations. Work in progress: preparations for removal of main engines; main engine drying operations; SRB stacking operations in Vehicle Assembly Building; payload bay door radiator inspections and Ku-band inspections. Main engine removal has been scheduled. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 16, 1992.]

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PRSD TESTS COMPLETED: DISCOVERY

Discovery continues to undergo extensive inspections and modifications in Orbiter Processing Facility Bay 2. Work completed: power reactant and storage distribution system tests; freon coolant loop servicing (complete to date) and payload doors opened. Work in progress: Orbiter electrical system validations checks and water spray boiler leak and functional tests. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 16, 1992.]

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ENDEAVOUR'S DOORS DAMAGED ON STS 49

The payload bay doors of Endeavour were damaged on its STS 49 mission, the maiden voyage for the newest Space Shuttle. "Both of the 60-foot-long doors are slightly warped, and a corner of the right door has come loose from its frame," according to NASA Vehicle Manager Pepper Phillips. A search for other damage is underway, he said. NASA managers have not yet decided to discuss whether to replace the doors, Phillips said, and he was unable to estimate the cost of such a replacement or whether Endeavour's next mission - STS 47 - will have to be delayed. The damage was caused when a latch securing the left-hand door failed to fasten properly. Phillips said, "Our problem now is to go find out why the left-hand door failed to latch as it was designed." [Banke, FLORIDA TODAY, p. 4A, June 17, 1992; Date, THE ORLANDO SENTINEL, July 8, 1992.]

June 17:

STS 50: CAVITY PURGE/LEAK CHECKS

At Launch Complex 39A, technicians are making the final preparations for Columbia's STS 50 mission, now scheduled for June 25. Work completed: part one of the ordnance operations; checkout of the regenerable CO² removal system (RCRS); special extended duration Orbiter (EDO) cryogenic confidence test; cavity purge and leak checks. Work in progress: pre-launch hypergolic fuel pressurization (with the pad closed to all but essential workers); auxiliary power unit closeouts; launch countdown preparations. The second part of the ordnance operations and aft compartment closeouts have been scheduled. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 17, 1992.]

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ATLANTIS: TCDT COMPLETED

At the same time that Columbia is undergoing pre-launch preparations at Launch Complex 39A, Atlantis is at Launch Complex 39B undergoing initial preparations for its STS 46 mission. Work completed: terminal countdown demonstration test (TCDT) and inertial measurement unit calibrations. Work in progress: rudder speed brake bondings; preparations for auxiliary power unit pre-launch propellant servicing; helium signature test.

Pre-launch propellant loading operations have been scheduled. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 17, 1992.]

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STS 47: ENDEAVOUR IN OPF BAY 3

Technicians have completed: Spacelab equipment interface tests with the STS 47 crew in attendance; window inspections; reaction control system pod thruster inspections; Orbiter power system validations. Work in progress: preparations for main engine removal; Ku-band antenna tests; fuel cell voltage tests; main engine drying operations; payload bay door radiator inspections; SRB stacking operations in the Vehicle Assembly Building. Main engine removal has been scheduled. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 17, 1992.]

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DISCOVERY: INSPECTIONS CONTINUE

In Orbiter Processing Facility Bay 2, technicians are continuing tests and inspections of the Space Shuttle Discovery. Work completed: freon coolant loop servicing (complete to date) and the payload bay doors were opened. Work in progress: power reactant and storage distribution system tests; Orbiter electrical system validations checks; water spray boiler leak and functional tests; auxiliary power unit hot oil flush; main propulsion system leak and functional tests. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 17, 1992.]

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SHUTTLE TO DOCK WITH MIR IN 1993

In October 1993, a Russian cosmonaut will fly aboard a Space Shuttle and in 1994 a Shuttle will dock with a Russian Mir Space Station. These missions will fulfill an agreement signed today by Russian Federation President Boris N. Yeltsin and American President George Bush. The international docking will be the second such event in space history; in 1975 an Apollo Command Module docked with a Soyuz capsule in fulfillment of a 1972 agreement with President Richard M. Nixon and Soviet Secretary General Leonid Brezhnev. Several cosmonauts will train with American astronauts for the STS 60 mission on which the crew will space walks and practice techniques for assembling a space station. ["Presidents Approve U.S.-Russian Space Crew Mission," FLORIDA TODAY, p. 5A, June 18, 1992; Leary, THE NEW YORK TIMES, p. A9, June 18, 1992.]

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ATLAS 2 LAUNCH SET: JUNE 20

U.S. Air Force Major Garlan Perugini announced today that June 20 will be the launch date for an Atlas 2 rocket which will carry a \$160 million military communications satellite. "So far everything looks good. We haven't heard of any problems with the vehicle or payload," he said. The satellite is the second of ten Department of Defense spacecraft to be launched. [Halvorson, FLORIDA TODAY, p. 8A, June 18, 1992.]

June 18:

STS 50: RCRS CHECKOUT

The Space Shuttle Columbia is awaiting its June 25 launch on Launch Complex 39A. Work completed: pre-launch hypergolic fuel pressurization; ordnance operations (part 1); checkout of the regenerable CO² Removal System (RCRS); special extended duration Orbiter cryogenic confidence test; cavity purge and leak checks. Work in progress: aft compartment closeouts; launch countdown preparations; auxiliary power unit closeouts; contingency spacesuit installation into the Orbiter's airlock. Work scheduled: ordnance

operations (part 2); purge of the external tank; countdown begins at 8:00 a.m. June 22; astronaut arrival expected at 10:00 a.m. on June 22; launch remains scheduled for 12:07 p.m. EDT, June 25. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 18, 1992.]

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ATLANTIS: HELIUM SIGNATURE TEST

At Launch Complex 39B, Atlantis has just undergone a helium signature test; preparations for auxiliary power unit pre-launch propellant servicing; payload bay doors closed for hypergolic operations. Work in progress: pre-launch propellant loading operations with the pad closed to all but essential personnel. Rudder speed brake bondings are scheduled. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 18, 1992.]

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ENDEAVOUR IN OPF BAY 3

In Orbiter Processing Facility Bay 3, Endeavour has just concluded fuel cell voltage tests and main engine drying operations. Work in progress: payload bay flood light inspections; preparations for main engine removal; payload bay door radiator deservicing and post flight inspections; SRB (right aft center segment) stacking operations in the Vehicle Assembly Building. Main engine removal is scheduled for next week. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 18, 1992.]

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STS 53: DISCOVERY IN OPF BAY 2

To date, the freon coolant loop servicing of Discovery has been completed and the payload bay doors opened. Work in progress: power reactant and storage distribution system tests; Orbiter electrical system validations checks; water spray boiler leak and functional tests; auxiliary power unit hot oil flush; main propulsion system leak and functional tests. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 18, 1992.]

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ATLANTIS' ENGINES CLEARED FOR LAUNCH

"The pump seal has been exonerated and there is no need to research it further, or do any work on the seal at the pad," said Kennedy Space Center spokesman **Bruce Buckingham**. No problems were discovered after a review of paperwork documenting inspections performed on the Orbiter's engines. NASA Administrator **Daniel S. Goldin** had ordered the safety review. The target for Atlantis' STS 46 launch had been July 16, but the unofficial date has now been moved by managers to July 21. The change was made because flight controllers in Houston need a few more days of training between the end of Columbia's STS 50 mission and the beginning of STS 46. [Banke, FLORIDA TODAY, p. 6A, June 19, 1992.]

June 19:

STS 50: SPACESUITS INSTALLED

Pad workers at LC 39A have installed contingency spacesuits in Columbia's airlock in preparation for its STS 50 mission, now scheduled for June 25. The technicians also completed auxiliary power unit closeouts. Work in progress: forward aft compartment closeouts; launch countdown preparations; purge of external tank; mass memory unit loads. Work Scheduled: part two of ordnance operations; countdown beginning at 8:00 a.m. EDT June 22; astronaut arrival scheduled for 10:00 a.m. EDT June 22; launch set for 12:07 p.m. EDT June 25. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 19, 1992.]

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ATLANTIS: PAYLOAD BAY DOORS CLOSED

A helium signature test has been completed on Atlantis and the Orbiter's payload bay doors have been closed for hypergolic operations. Launch Complex 39B has been closed to all but essential personnel for the pre-launch propellant loading operations. Work scheduled: rudder speed brake bondings; cabin vent door checks; auxiliary power unit checks. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 19, 1992]

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STS 47: ENDEAVOUR PREPARATIONS

Work completed: payload bay flood light inspections; main engine drying operations and fuel cell voltage tests. Work in progress: preparations for main engine removal; payload bay door radiator deservicing and post flight inspections; water spray boiler leak and functional tests; solid rocket boosters stacking operations in Vehicle Assembly Building High Bay 3. Work scheduled: main engine removal next week; removal of payload bay door radiator. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 19, 1992]

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STS 53: DISCOVERY PROCESSING IN OPF BAY 2

Freon coolant loop servicing on Discovery has been completed and the Orbiter's payload bay doors have been opened. Work in progress: power reactant and storage distribution system checks; Orbiter electrical system validations tests; water spray boiler leak and functional tests; auxiliary power unit hot oil flush; main propulsion system leak and functional checks. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 19, 1992]

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O & C FIRE: "NOTHING"

"It turned out to be nothing," said KSC spokesman Karl Kristofferson about the fire which took place today in the Operations and Checkout Building at Kennedy Space Center. Kristofferson said, "It wasn't much flame. It was mostly smoke and odor." The fire occurred when a lamp was accidentally knocked into a wall of clear plastic, which was put up to protect employees from an asbestos-removal area. Kristofferson said that two gallons of water were used to stop the melting plastic. The incident began at approximately 12:07 p.m.; workers were able to return to work within thirty minutes. Officials said that no one was hurt by the fire and that there was no estimate of damage. [Banke, FLORIDA TODAY, p. 5A, June 20, 1992.]

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STS 50: AFT COMPARTMENT WORK

The launch of STS 50 remains on schedule for 12:07 June 25, according to KSC spokesman Bruce Buckingham. Tomorrow pad workers will continue last minute work inside Columbia's aft compartment looking toward a closeout by late tomorrow night. Ordnance installation should be completed by tomorrow night at about 8 p.m. At Cape Canaveral Air Force Station, the Mars Observer spacecraft arrived and was taken to Hangar AO. Dozens of support personnel arrived for temporary residence in Brevard County to continue processing the spacecraft for its September 16 launch aboard a commercial Titan 3 rocket. [NASA/KSC News Release No. 79-92, June 19, 1992; Banke, FLORIDA TODAY, p. 5A, June 20, 1992; Date, THE ORLANDO SENTINEL, p. A-1, June 21, 1992.]

June 20:

ATLAS 2 SET FOR LAUNCH TONIGHT

An Air Force Atlas 2 set for launch tonight between 5:49 and 7:16 p.m. EDT; it had a 60 percent probability of acceptable weather for launch with thunderstorms and clouds the only potential constraints to launch. However, an unexplained power outage forced the Air Force to scrub the launch and reschedule it for June 22. The launch was rescheduled for June 21, but a thunderstorm in the launch area prevented a planned 5:49 p.m. liftoff. "We had lightning within 10 miles of the launch pad and no relief in sight," according to Maj. **Garian Perugini**, spokesman for the 45th Space Wing which is headquartered at Patrick Air Force Base. Engineers were still attempting late Saturday to determine the reason for the power outage which interrupted the flow of electricity to the rocket, payload and ground support equipment. Power was restored, after 45 minutes, with a backup diesel generator. The Atlas is to deploy a communications satellite into orbit. The launch was rescheduled for June 22 between 5:50 and 7:17 p.m.

Meanwhile, at Cape Canaveral Air Force Station, a Titan 4 rocket which has been rusting at its launch pad will be partially disassembled and eventually removed from the pad. The Titan has been at the pad for a year. Col. **Frank Stirling** said, "It's a frustrating setback." He said that engineers had spotted water and rust between segments of one of the Titan's boosters. "They told me it looked like a bathtub ring with rust and some water in there," Stirling said. He added that engineers were concerned that the corrosion might lead to O-ring failure like that which led to the Challenger accident in 1986. [Date, THE ORLANDO SENTINEL, June 20, 1992; "Launch Tonight," FLORIDA TODAY, p. 1A, June 20, 1992; Halvorson, FLORIDA TODAY, p. 1A, June 20, 1992; Halvorson, FLORIDA TODAY, p. 1A, June 21, 1992; Halvorson, FLORIDA TODAY, p. 1A, June 22, 1992.]

June 22:

STS 50 COUNTDOWN BEGINS TODAY

The countdown for Columbia's STS 50 mission starts today at 8:00 a.m. EDT. The seven-member crew is expected to arrive at Kennedy Space Center at about 10:00 a.m. The crew includes Commander **Richard N. Richards**, Pilot **Kenneth D. Bowersox**, Mission Specialists **Bonnie J. Dunbar**, **Ellen S. Baker**, and **Carl J. Meade** and Payload Specialists **Eugene Trinh** and **Lawrence DeLucas**. The launch window for STS 50 begins at 12:07 p.m. EDT. Preparations are underway for loading of onboard fuel cell cryogenic tanks. A purge of the external tank has been completed as have been mass memory unit loads and the second part of ordnance operations. Aft closeouts remain to be done. Loading of onboard fuel cell cryogenic tanks is set for June 23. There is a 70 percent chance of favorable weather for launch day. [Date, THE ORLANDO SENTINEL, pp. A-1 & A-8, June 21, 1992; Halvorson, FLORIDA TODAY, p. 1A, June 22, 1992; KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 22, 1992; "Shuttle Count Begins," THE NEW YORK TIMES, p. B8, June 23, 1992; "Weather Forecast for STS 50," June 23, 1992; KSC SHUTTLE STATUS REPORT, 10:00 a.m., June 23, 1992.]

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STS 46: HELIUM SIGNATURE TEST DONE

At Launch Complex 39B, technicians have completed a helium signature test upon Atlantis' fuel lines and have completed the STS 46 pre-launch hypergolic propellant loading operations. Work in progress: opening payload bay door and gaining access to payload bay; rudder speed brake bondings; removal of the cabin vent door motor. Work scheduled: payload purge operations and vent door checks; auxiliary power unit checks; arrival of payload to pad. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 22, 1992.]

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STS 47: ENDEAVOUR PROCESSING

Mass memory unit loads have been completed in OPF Bay 3 where Endeavour is being processed for its STS 47. Main engine drying operations and fuel cell voltage tests have also been completed. Work in progress: main engine removal; payload bay door radiator deservicing and post flight inspections; auxiliary power unit lube oil servicing; removal of payload bay door radiator; water spray boiler leak and functional tests; solid rocket booster (right forward segment) stacking operations in Vehicle Assembly Building high bay 3. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 22, 1992.]

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BOWERSOX: 'NEAT SCIENCE'

STS 50 Pilot **Kenneth D. Bowersox**, in his Shuttle Landing Facility landing remarks, said today that "we've got a lot of neat science, and it's got a lot of potential to do good things for us." Payload Commander **Bonnie J. Dunbar** said, "We've been training for a year and nine months and we think we're ready." The crew, which also includes Commander **Richard N. Richards**, Mission Specialists **Ellen S. Baker** and **Carl J. Meade** and Payload Specialists **Lawrence DeLucas** and **Eugene Trinh**, arrived at the Shuttle Landing Facility this morning just after 10 o'clock. NASA Test Director **Eric F. Redding** said, "Columbia may be the oldest Orbiter, but I feel with all the modifications...it's the best Orbiter we have." Halvorson, FLORIDA TODAY, p. 1A, June 23, 1992.]

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GOLDIN: NASA SHOULD PRIVATIZE

"I think portions of the space program can and should be privatized," said NASA Administrator **Daniel S. Goldin** at a Gannett News Service interview. "It's not going to happen overnight. 'We're going to go to Mars and we want to privatize that' - well, no company can quite do that. On the other hand, there are certain routine functions that get performed that I think should be (privatized)." **Jerry Gray**, Director of Science and Technology Policy at the American Institute of Aeronautics and Astronautics, said, "The previous administrator [**Richard H. Truly**] was not strong on either commercialization or privatization -he thought NASA should run the show. The fact that Goldin is coming in and saying he is going to push it is definitely news." [Eisler, FLORIDA TODAY, p. 2A, June 23, 1992.]

June 23:

ATLAS DELAYED BY WEATHER, AGAIN

An attempt to launch the Air Force's Atlas 2 was scrubbed by bad weather on June 21; bad weather prevented even scheduling an attempt for June 22. The launch has been tentatively rescheduled for today, though weather may also prevent a liftoff this evening. The Air Force decided not to schedule the launch until its morning weather briefing. If the mission must be delayed again, the earliest possible launch date would be June 27, after the STS 50 launch now scheduled for June 25. The Atlas will carry a \$160 million military communications satellite into orbit. [Halvorson, FLORIDA TODAY, p. 2A, June 23, 1992; "Summer Showers Stall Atlas Launch," FLORIDA TODAY, p. 1A, June 24, 1992; Date, "Atlas Delayed," THE ORLANDO SENTINEL, June 23, 1992.]

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'CREWED' MISSION

Space policy experts working on a refinement of an international convention on manned space flight suggest that the gender-neutral term "crewed" for missions which include a woman. Currently, NASA uses the term "manned," by NASA Administrator **Daniel S.**

Goldin said that he had "promised his daughter he'd change it," said Goldin's spokeswoman Barbara Schwartz. ["Crewed Mission," USA TODAY, p. 3A, June 23, 1992.]

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STS 50: LAUNCH STATUS

With the launch countdown underway, technicians at Launch Complex 39A closed Columbia's aft compartment for flight at about 3 p.m. yesterday. Work in progress: loading the liquid oxygen and liquid hydrogen reactants into the Orbiter's fuel cell storage tanks and into the tanks on the extended duration Orbiter pallet; pad closed to all by essential personnel until about 5 p.m. tonight. Work scheduled: replacement of two of three TACAN antennas which failed during self tests last night; troubleshooting of a liquid oxygen temperature transducer on main engine No. 2 main combustion chamber; stowage of flight crew equipment; activation of the Orbiter's communications systems tonight; move rotating service structure away from the vehicle at 11 a.m. tomorrow; loading of propellant into the external tank beginning at 3:47 a.m. June 25; launch scheduled for 12:07 p.m. June 25.

"We think the highest probability is that (the temperature sensor) is the problem, and we'll get it fixed and press on for Thursday," said Leonard S. Nicholson, Shuttle Program Director. Options include replacing the sensor and flying the Orbiter as is and working around the sensor problem. Flight Crew: The flight crew will perform fit checks of their equipment and have a medical exam. Commander Richard N. Richards and Pilot Kenneth D. Bowersox flew in the Shuttle Training Aircraft this morning. The crew will have a briefing with astronaut support personnel to discuss procedures in boarding the Orbiter on launch day. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 23, 1992; Brown, FLORIDA TODAY, p. 1A, June 24, 1992; Date, THE ORLANDO SENTINEL, June 23, 1992.]

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STS 46: ATLANTIS PROCESSING

At Launch Complex 39B, workers are purging the cavity between the external tank and Atlantis. They are also attaching small doublers on the rudder speed brake and replacing a motor for vent door no. 3. Launch of STS 46 is targeted for mid-July. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 23, 1992.]

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ENDEAVOUR PROCESSING IN OPF BAY 3

Work in progress includes: removing the three main engines; preparations for Ku-band antenna tests; testing of the forward reaction control system at the Hypergolic Maintenance Facility; leak and functional tests of the water spray boilers; deservicing of freon coolant loop no. 1; systems tests of the power reactant storage and distribution system. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 23, 1992.]

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DISCOVERY: OPF BAY 2

In Orbiter Processing Facility Bay 2, Discovery continues to undergo processing activities: leak and functional tests of the water spray boilers; inspections of the main propulsion system; connecting auxiliary power unit No. 3; flushing the ammonia system. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 23, 1992.]

June 24:

STS 50 READY: GLITCHES FIXED

During the night pad technicians successfully replaced and retested the liquid oxygen temperature transducer. They replaced two TACAN navigation systems. One of those units, located in the middeck failed the retest and is being replaced in parallel with the launch countdown. They also activated the Orbiter's communications system and loaded liquid oxygen and liquid hydrogen reactants into the Orbiter's fuel cell storage tanks and into the tanks on the extended duration Orbiter (EDO) pallet. Work in progress: countdown entered a 13 hour, 47 minute built-in hold at the T-11 mark (at 8 a.m. today); stowing items in the crew compartment; replacing and retesting one of the TACAN navigational aids; preparations to move the rotating service structure at about 2 p.m. weather permitting; activation of the inertial measurements; preparing the pad area for launch.

Work scheduled: begin loading propellant into the external tank at 3:47 a.m. June 25; crew wake up at 6:30 a.m. June 25 for breakfast at 7:30 a.m.; crew suiting and departure for the launch pad; launch scheduled for 12:07 a.m. EDT, the opening of a 2 and 1/2 hour window. Today the flight crew will receive a briefing on the status of the vehicle, payload and weather. STS 50 Pilot Kenneth D. Bowersox is scheduled to fly in a T-38 aircraft and the crew is maintaining the same sleep/wake cycle they will be on during the STS 50 mission. There is a 40 percent chance of having acceptable weather conditions at the time of launch. "It's almost too close to call," said Captain Mike Adams, Air Force weather officer. "I'd have to put \$2 on Mother Nature." Because of the launch of STS 50, Spaceport USA will be closed today until one hour after launch. Launch Director Robert B. Sieck said that a delay past Friday in launching Columbia could push the liftoff into next week so the Air Force could launch its Atlas 2 rocket which has been scrubbed three times already. [KSC SHUTTLE STATUS REPORT, 11:00 a.m., June 24, 1992; Halvorson, FLORIDA TODAY, p. 1A, June 25, 1992; "Spaceport USA Closed Today," FLORIDA TODAY, p. 3A, June 25, 1992; "Shuttle Countdown," USA TODAY, p. 3A, June 25, 1992; Leary, THE NEW YORK TIMES, p. A19, June 25, 1992.]

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ATLANTIS: MOTOR REPLACED

At Launch Complex 39B, technicians replaced one of Atlantis' motors for vent door No. 3 and purged the cavity between the external tank and the Orbiter. Work in progress: preparations to close the payload bay doors; preparations to power down the Orbiter until after the STS 50 launch. The STS 46 mission remains scheduled for mid-July. [KSC SHUTTLE STATUS REPORT, 11 a.m., June 25, 1992.]

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ENDEAVOUR: STS 47 PROCESSING

Endeavour's three main engines have been removed during the Orbiter's stay in OPF Bay 3. Work in progress: preparations for Ku-band antenna tests; testing of the forward reaction control system at the Hypergolic Maintenance Facility; leak and functional tests of the water spray boilers; deservicing of freon coolant loop No. 1; systems tests of the power reactant storage and distribution system. [KSC SHUTTLE STATUS REPORT, 11 a.m., June 25, 1992.]

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DISCOVERY: PROCESSING IN OPF BAY 2

Discovery's Ku-band antenna is being tested in OPF Bay 2; the main propulsion system is being inspected. The ammonia system is being flushed and leak and functional tests

of the water spray boilers are also underway. [KSC SHUTTLE STATUS REPORT, 11 a.m., June 25, 1992.]

June 25:

STS 50 LAUNCH ROARIN' SUCCESS

"We'll see you all in a couple of weeks," radioed Commander Richard N. Richards before Columbia began its 12th flight, the 48th mission of the Space Shuttle Program. Despite unfavorable weather - a 40 percent chance of acceptable conditions - the Space Shuttle Columbia roared into space from Launch Complex 39A only five minutes late - at 12:12:23.0534 p.m. EDT. The delay was due to cloudy weather in the launch area. "What you don't want to do," said Launch Director Robert B. Sleck, "is to fly through a cloud that still might have enough energy to trigger lightning." After climbing for 8 and a half minutes Columbia began orbiting Earth at 17,500 mph. Astronaut Steven R. Nagel flew above the KSC launch area in NASA's modified Gulfstream jet to help determine that insufficient moisture existed in the LC 39A launch area clouds to enable lightning to be generated. Prior to launch, technicians had trouble securing the side hatch of the Orbiter. In the effort to solve the hatch problem, technicians went into the crew cabin and determined that the hatch lock was working properly. Shuttle Program Director Brewster H. Shaw, Jr. said, "So we reclosed the hatch and took those folks out, because they didn't want to go." Engineers determined that three navigation units were working properly despite a problem with the units' computer program.

Minimal launch pad damage was sustained; mobile launcher platform No. 3 will be transferred back to the Vehicle Assembly Building July 1. The booster retrieval ships are currently towing the STS 50 boosters back to Hangar AF on Cape Canaveral Air Force Station. The Freedom Star is towing the left booster and the Liberty Star is towing the right solid rocket booster. The ships are expected to pass through Port Canaveral at 1 p.m. and 3 p.m. June 26. The estimated time of arrival at Hangar AF is 3 and 4:30 p.m. June 26. Weather conditions could hamper or slow down the towing operation. Landing of Columbia is set for Edwards Air Force Base, CA, on July 8 at 5:40 p.m. PDT at Edwards. [Halvorson, FLORIDA TODAY, pp. 1A & 4A, June 26, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, June 26, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., June 26, 1992; '7 Astronauts 'Do Science,' Not Spacewalk,' USA TODAY, p. 2A, June 26, 1992; Leary, THE NEW YORK TIMES, p. A11, June 26, 1992; Brazil, THE ORLANDO SENTINEL, pp. A-1 & A-6, June 25, 1992.]

June 26:

ATLANTIS: STS 46 HAS JULY LAUNCH

At Launch Complex 39B, Atlantis is undergoing closeouts of the rudder speed brake and power up testing. Scheduled work: transfer of the payload to the launch pad the first week of July; launch is targeted for later in July. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 26, 1992.]

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ENDEAVOUR: STS 47 PROCESSING

The Space Shuttle Endeavour, now in OPF Bay 3, is undergoing processing for its upcoming STS 47 mission to take the Spacelab J into space. Work in progress: draining freon from the coolant loops; preparations for Ku-band antenna tests; functional tests of the orbital maneuvering system (OMS) pods; testing of the forward reaction control system at the Hypergolic Maintenance Facility; leak and functional tests of the auxiliary power units; systems tests of the power reactant storage and distribution system. Discovery is in OPF Bay 2 for its STS 53 processing operations: preparations to install

the right OMS pod next week; tests of the Ku-band antenna; inspections of the main propulsion system; flushing the ammonia system. [KSC SHUTTLE STATUS REPORT, 10 a.m., June 26, 1992.]

June 27:

SPACELAB J READY

The Space Shuttle Endeavour will receive the payload for its September flight next week. The STS 47 mission will carry the Japanese-sponsored Spacelab into orbit. In January, the Spacelab was used during the microgravity sciences mission aboard Discovery. "It's been a real challenge," said Payload Manager Glenn Snyder. "Spacelab J may be the forerunner on how to do Spacelab missions." [Brown, FLORIDA TODAY, p. 10E, June 28, 1992.]

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CONGRESSMEN TOUR KSC

U.S. Representative George Brown (D-CA), Chairman of the House of Representatives Science, Space and Technology Committee, and Florida Congressman Jim Bacchus, a member of Brown's committee, will tour Kennedy Space Center today. KSC Director Robert L. Crippen will escort the Congressional group on a tour which will include the Space Station Processing Facility (SSPF) now under construction to serve as the focal point for Space Station Freedom processing activities. [NASA/KSC News Release No. 84-12, June 26, 1992.]

June 29:

ATLAS: FIFTH TRY TODAY

Bad weather has plagued the Cape Canaveral Air Force Station with such regularity this month that the Air Force will make a fifth attempt today to launch its Atlas 2 rocket; meteorologists predict only a 30% chance of favorable weather when the window opens at 5:53 p.m. and only a 50% chance by the window's close at 7:18 p.m. Thunderstorms which might trigger a lightning strike are of particular concern to launch officials. ["Atlas Rocket Will Try Again," FLORIDA TODAY, p. 1A, June 29, 1992.]

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STS 46: RUDDER BRAKE BONDINGS

At Launch Complex 39B, technicians have completed rudder speed brake bondings. Work in progress: hydraulic circulation and sample operations; preparations for main engine flight readiness test and for the arrival of the payload at LC 39B. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 29, 1992.]

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STS 47: ENDEAVOUR PROCESSING

Freon coolant loop deservicing and inspections have been completed on Endeavour which is undergoing STS 47 flight processing in OPF Bay 3. Work in progress: main engine removal; removal of payload bay door radiator; orbital maneuvering system leak and functional tests and solid rocket booster stacking operations in Vehicle Assembly Building high bay 3. Hydraulic operations are scheduled. Meanwhile, Discovery is in OPF Bay 2 where it is undergoing main propulsion system leak and functional checks and structural corrosion inspections. Orbital maneuvering system pod installation has been scheduled. [KSC SHUTTLE STATUS REPORT, 10:30 a.m., June 29, 1992.]

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TITAN III ROLLOUT SET

The rollout of the Titan III rocket which will launch the Mars Observer spacecraft on an interplanetary trajectory is scheduled to occur July 1. The vehicle will make a slightly more than one-mile trip from the Solid Motor Assembly Building to Launch Complex 40 to begin final checkout and preparations for launch in September. The rocket is built by Martin Marietta which is responsible for launching the vehicle for NASA. [NASA/KSC News Release No. 85-92, June 29, 1992.]

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GLITCH DELAYS ATLAS LAUNCH, AGAIN

The launch of an Air Force Atlas 2 rocket was called off today when a problem with a navigation unit was discovered. Engineers are working on the problem presently and the launch has tentatively been rescheduled for July 1 between 5:53 p.m. and 7:19 p.m. ["Glitch Delays Atlas Rocket," FLORIDA TODAY, p. 4A, June 30, 1992.]

June 30:

STS 46: ENGINES READY FOR TEST

Preparations have been completed at Launch Complex 39B for the main engines of Atlantis to undergo a flight readiness test; hydraulic circulation, sample operations and rudder speed brake bondings have been completed. Work in progress: main engine flight readiness test; aerosurface cycle and checks; rudder speed brake closeouts; preparations for payload arrival at LC 39B which has been scheduled. [KSC SHUTTLE STATUS REPORT, 9:30 a.m., June 30, 1992.]

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STS 47: ENDEAVOUR PROCESSING

In OPF Bay 3, freon coolant loop deservicing and inspections of Endeavour have been completed as has been the removal of the payload bay door radiator. Work in progress: orbital maneuvering system leak and functional checks; payload bay keel installations; Ku-band troubleshooting; flight control checks; orbital maneuvering system functional operations; solid rocket booster stacking operations in Vehicle Assembly Building high bay 3. Work scheduled: hydraulic operations and payload bay door cycling and checks. [KSC SHUTTLE STATUS REPORT, 9:30 a.m., June 30, 1992.]

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STS 53: DISCOVERY IN OPF BAY 2

Discovery's orbital maneuvering system pod has been delivered to the OPF. Work in progress: power reactant and storage distribution system tests; main propulsion system leak and functional checks; installation of onboard helium tanks; structural corrosion inspections. The orbital maneuvering system pod will be installed tonight. [KSC SHUTTLE STATUS REPORT, 9:30 a.m., June 30, 1992.]

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NAVIGATION UNIT REPLACED: ATLAS

The launch of the Air Force's Atlas rocket has been rescheduled for July 2; a faulty navigation unit has been replaced and will be tested tomorrow. ["New Part Clears Atlas for Liftoff," FLORIDA TODAY, p. 4A, July 1, 1992.]

JULY

July 1:

STS 46: MAIN ENGINE FRT

The main engines of Atlantis have completed their flight readiness test in preparation for the STS 46 mission. Other work completed: aerosurface cycle and checks; hydraulic circulation and sample operations; rudder speed brake closeouts. Work in progress: engineering evaluations of recently completed flight readiness test and hydraulic operations; preparations for payload arrival at Launch Complex 39B. The STS 46 payload is set to arrive at the pad and to be installed next week. **[KSC SHUTTLE STATUS REPORT, 9:30 a.m., July 1, 1992.]**

I

STS 47: ENDEAVOUR PROCESSING

In OPF Bay 3, payload bay keel installations on Endeavour have been completed as have freon coolant loop deservicing and inspections and the removal of the payload bay door radiator. Work in progress: inspections of the payload bay door blankets; payload bay door cycling and checks; orbital maneuvering system leak and functional checks; Ku-band functional tests; spacelab/Orbiter pre-mate checks; solid rocket booster stacking operations in the Vehicle Assembly Building high bay 3. The Spacelab payload will be installed next week. **[KSC SHUTTLE STATUS REPORT, 9:30 a.m., July 1, 1992.]**

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DISCOVERY: OMS POD DELIVERED TO OPF

Discovery's orbital maneuvering system pod has been delivered to the Orbiter in OPF Bay 2 and elevon cove and flipper door closeouts have been completed. Work in progress: mechanical and electrical mates of the orbital maneuvering system pod to the Orbiter; main propulsion system leak and functional checks; installation of onboard helium tanks; installation of hydraulic lines and equipment; structural corrosion inspections. **[KSC SHUTTLE STATUS REPORT, 9:30 a.m., July 1, 1992.]**

I

ATLANTIS TO BE MODIFIED IN CALIFORNIA

Atlantis is due for extensive modifications similar to the ones undergone by Columbia and Discovery, but, unlike Discovery, Atlantis is expected to be sent to the Palmdale, CA, plant where Columbia was modified by Rockwell International. That announcement was made by Thomas Utsman, Shuttle Program Director for NASA. NASA officials said the decision to modify Atlantis in California was made to relieve processing pressure at Kennedy Space Center. He said, "This means the KSC team can devote 100 percent of their efforts to safely and efficiently carrying out the manifest. We estimate it will require about a year to modify Atlantis, and we won't have to tie up an Orbiter processing facility for that time. This results in a lot of flexibility in terms of processing the other Orbiters. Performing the work at Palmdale also gives us the added advantage of being able to maintain a skilled, highly effective work force in California which is essential for us to carry out our structural spares work. By maintaining this manufacturing capability at Palmdale, NASA also will be able to integrate a Russian automated rendezvous and docking mechanism should ongoing negotiations with the Russians prove fruitful. NASA has a team leaving for Russia next week to pursue this capability, which would allow the Space Shuttle to dock with the Russian Mir and which could be used on Space Station Freedom."

NASA also said that Atlantis will have a mechanism installed which will allow the Orbiter to dock with the Russian space station Mir. U. S. Rep. Jim Bacchus said, "If they did the work here, it would create several hundred jobs. I think we can do these modifications faster, cheaper and better in Brevard County." He said that cost comparisons showed that KSC could do the modifications for \$25 to \$30 million less than in California. "I'm very unhappy about this decision and I'm going to hold NASA's feet to the fire," Bacchus said. Utsman responded, saying, "One of the things we got criticized for after the Challenger accident was pushing too hard and trying to do too many things with the guys at the Cape. This is an honest attempt to try to help them. What we want to do is make their job bearable." Utsman, a former Kennedy Space Center Deputy Director, said that the decision would not result in any jobs being lost at KSC. [Halvorson, FLORIDA TODAY, p. 1A, July 2, 1992; NASA/KSC News Release No. 92-101, July 1, 1992; Date, THE ORLANDO SENTINEL, July 3, 1992; Halvorson, FLORIDA TODAY, p. 10E, July 26, 1992.]

July 2

ATLAS LAUNCH ATTEMPT NO. 7

The Air Force will attempt, again, to launch its Atlas 2 rocket tonight between 5:54 and 7:20 p.m. EDT; the launch has been scrubbed six times over the past two weeks. Air Force meteorologists predicted a 70 percent chance of favorable weather for launch tonight. ["Atlas Launch Attempt Today," FLORIDA TODAY, p. 5A, July 2, 1992.]

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RECORD SPACELAB TURNAROUND

When the Spacelab-J module is transported to the Orbiter Processing Facility and installed in Endeavour's payload bay next week, it will mark the quickest such turnaround ever of a Spacelab module. The Spacelab-J module last flew in January on the International Microgravity Laboratory-1 mission. Following that highly successful flight, the module was transported back to its processing bay in KSC's Operations and Checkout Building and readied for the STS 47 flight. The 19-week reconfiguration and checkout of the payload easily eclipses the average Spacelab processing time of 24 weeks. "We surprised ourselves," commented Glenn Snyder, STS 47 Payload Processing Manager. "We went into this flow wondering whether or not it was possible to process a payload for flight on such a tight schedule. But the team pitched in, rose to the challenge and did it. Everyone pulled together as a team. There were never any turf battles or squabbles over anything. When little problems popped up, everyone just came together and fixed them," he continued. "It's been a real pleasure working on this payload."

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TITAN III ROLLOUT TODAY

The Titan III launch vehicle which will deliver the Mars Observer Spacecraft to an interplanetary trajectory was rolled out to Launch Complex 40 today. The Martin Marietta rocket will propel the MOS on an 11-month journey to Mars. The mission must launch between September 16 and October 13 while Earth and Mars are properly aligned or wait for two years for another such alignment. A delay of that duration would cost NASA \$200 million. Currently, the launch is scheduled for September 16 during a window lasting from 1:02 to 2:34 p.m. NASA spokesman George Diller said, "So far the best laid plans of mice and men are working. The mission is coming together as envisioned." [Halvorson, FLORIDA TODAY, p. 10E, July 5, 1992; NASA/KSC News Release No. 85-92, July 1, 1992.]

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ATLAS 2 LAUNCHED TODAY

At 5:54 p.m. today, the Air Force launched its Atlas 2 rocket from Cape Canaveral Air Force Station. "We're really happy to have seen it go," said Major Garian Perugini, head of Public Affairs at Patrick Air Force Base. "It's been a long, drawn-out process with the weather systems that have been moving through and some of the mechanical problems we've had along the way." The Atlas payload was a \$160 million Defense Satellite Communications System spacecraft; it is an updated version of the satellites which provided intelligence information during the 1991 Persian Gulf War. [Halvorson, FLORIDA TODAY, p. 5A, July 3, 1992.]

July 6:

COLUMBIA TO LAND AT EDWARDS

The landing of the Space Shuttle Columbia is scheduled to occur at Edwards Air Force Base, CA, at 6:08 a.m. PDT on July 8. Kennedy Space Center's landing and recovery team will be on hand at the Dryden Flight Research Facility to prepare to prepare the Orbiter for its ferry flight back to KSC. STS 50 has set a new duration record for flights of Space Shuttles of 12 days, 20 hours and 56 minutes. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 6, 1992; Date, THE ORLANDO SENTINEL, July 6, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 7, 1992; Halvorson, FLORIDA TODAY, p. 1A, July 7, 1992; "Shuttle Record," USA TODAY, p. 3A, July 7, 1992; Date, "Columbia Sets Endurance Record," THE ORLANDO SENTINEL, July 7, 1992.]

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ATLANTIS: TSS & EURECA

Early this morning the TSS and EURECA payloads were transferred to Launch Complex 39B for installation in the Space Shuttle Atlantis. The STS 46 mission is targeted for launch in late July. Work in progress: preparations to install the Tethered Satellite System and the EURECA payload in the Payload Changeout Room at the pad; retest of the newly replaced main engine liquid oxygen temperature transducers. Work scheduled: Launch Readiness Review on July 7; installation of payloads on July 8; the interface verification testing between the Orbiter and payloads July 9. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 6, 1992.]

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ENDEAVOUR: STS 47 PREPARATIONS

In OPF Bay 3, technicians are preparing to install the Spacelab-J payload in Endeavour for its upcoming STS 47 mission. Other work in progress: functional tests of the orbital maneuvering system pod; leak and functional tests of the auxiliary power units; inspections of the payload bay doors. The Spacelab-J will be installed in Endeavour on July 8. Discovery is in OPF Bay 2 where preparations are underway to install its right OMS pod next week. Other work in progress on OV 103: tests of the Ku-band antenna; inspections of the main propulsion system; flushing the ammonia system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 6, 1992.]

July 7:

ATLANTIS PRE-LAUNCH ACTIVITIES

Technicians at Launch Complex 39B continue preparations to install the TSS and EURECA payloads into Atlantis for its STS 46 mission. Work in progress: moving the rotating service structure around the Orbiter; connecting the Orbiter midbody umbilical unit (OMBU) to the Orbiter; opening the payload bay doors for payload installation; KSC Launch Readiness Review. Work scheduled: installation of payloads on July 8; interface

verification testing between the Orbiter and its payloads July 9. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 7, 1992.]

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STS 47: ENDEAVOUR IN OPF BAY 3

The Space Shuttle Endeavour is undergoing processing for its upcoming STS 47 flight in OPF Bay 3. Work in progress: preparations to install the Spacelab-J payload; functional tests of the orbital maneuvering system pod; leak and functional tests of the auxiliary power units; inspections of the payload bay doors. The installation of Spacelab J and Endeavour's forward reaction control system are scheduled to take place shortly. In OPF Bay 2, Discovery is having its ammonia system flushed and is undergoing testing of the right orbital maneuvering system pod; preparations to service the hydraulic system and inspections of the main propulsion system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 7, 1992.]

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JULY 30 LAUNCH FOR STS 46

Kennedy Space Center spokeswoman Lisa Malone announced today that Atlantis will commence its STS 46 mission on July 30; the launch has been delayed a week to make way for a "time-critical" unmanned rocket mission and to allow more time for astronaut training. The previous target date had been July 23. [Halvorson, FLORIDA TODAY, p. 1A, July 8, 1992; Date, THE ORLANDO SENTINEL, July 7, 1992.]

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DELTA 2 LAUNCH A SUCCESS

At 5:20 a.m. this morning, an Air Force Delta 2 was launched from Cape Canaveral Air Force Station. The Delta carried a Navstar Global Positioning System satellite. The rocket's nine boosters were jettisoned several minutes into the flight. McDonnell Douglas Space Systems Co. spokesman Tom Williams said, "The night launches are beautiful - beautiful and exciting." This Navstar deployment was the 14th in a planned series of 24 satellites; the entire system is expected to be completed in 1993. [Halvorson, FLORIDA TODAY, p. 2A, July 8, 1992; Date, THE ORLANDO SENTINEL, July 8, 1992.]

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LAUNCH FACILITY DEDICATED AT CCAFS

Shortly after the successful launch of a Delta 2 rocket from Cape Canaveral Air Force Station this morning, the Air Force and NASA joined with other aerospace officials to dedicate a \$335 million launch facility that will be used to launch unmanned missions to Mars. Standing in front of Launch Complex 40, and speaking to an audience of 200, officials praised the effort of constructing a completely new facility in two years. Martin Marietta Space Launch Systems was the prime contractor for the new complex; Bechtel National, Inc. constructed the facility. Alphonso Diaz, NASA Deputy Associate Administrator for Space Flight, said return to the "red" planet with the launch of the Mars Observer aboard a Martin Marietta Commercial Titan begins at the facility. Diaz spoke proudly of the time 17 years ago when he was an instrumentation engineer on the Voyager mission to Mars in 1975.

"The Mars Observer mission will provide data crucial to eventual human expedition to Mars," Diaz said. "It begins here within the next 90 days," referring to Launch Complex 40. Diaz complimented workers responsible for the construction and said, "you delivered on your commitment - now it is time for NASA to perform." Colonel Frank Stirling, Titan IV Manager for the USAF, described LC 40 as a magnificent achievement that will return

the nation to Mars. "Today is a triumph," he said, "a triumph of team work, a display of dedication of commitment to excellence and presentation to perseverance to a goal of meeting this nation's requirements to send a satellite on an interplanetary mission to Mars." Two years ago the USAF promised NASA a new launch complex would be ready for the September launch, Stirling told the audience and said that we are on the threshold of that promise. ["Aerospace Community Dedicates \$355 Million Launch Facility," MARTIN MARIETTA PRESS RELEASE, July 7, 1992; Note to Editors/News Directors: "Mars Observer Showing Scheduled at KSC on Wednesday, July 8," July 9, 1992.]

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ASSOCIATE ADMINISTRATOR FOR RUSSIAN PROGRAMS

NASA Administrator Daniel S. Goldin today announced the appointment of Samuel W. Keller as Associate Administrator for Russian Programs. The new function is being established within the Office of the Administrator and will give focus to the many programs involving NASA and the former Soviet Union. "NASA is actively pursuing opportunities for expanded cooperation in space activities with Russia. This area of international cooperation is critical and warrants creation of this new position. Sam Keller has the kind of experience necessary to ensure that our relationship with the Russian space program is beneficial to both sides. He will be responsible for overall coordination of the NASA program relating to cooperative endeavors with the Russian space program," Goldin said. [NASA/KSC News Release No. 92-103, July 7, 1992; "NASA Appoints Chief of Russian Programs," FLORIDA TODAY, p. 9E, July 12, 1992.]

July 8:

STS 50 EXTENDED ONE DAY

Columbia's record-breaking-duration flight was extended one extra day because of unacceptable weather conditions in California. There were rain showers and clouds in the area of Edwards Air Force Base. Weather conditions are forecast to improve slightly tomorrow in California and to be favorable for a landing in Florida. Mission controllers will continue evaluating the weather conditions at both landing sites through the evening and make their landing decision early tomorrow morning. The opportunity to land at KSC tomorrow is at 7:43 a.m. EDT. The landing opportunity at Edwards is on orbit 222 at 9:09 EDT. The KSC convoy team will be on station at 5:15 a.m. tomorrow at the Shuttle Landing Facility to support a possible landing at Kennedy Space Center. KSC's primary landing and recovery team for Columbia is on station at the Dryden Flight Research Facility ready to prepare the Orbiter for its ferry flight back to Florida. [Date, THE ORLANDO SENTINEL, p. A-7, July 8, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 8, 1992; Date, THE ORLANDO SENTINEL, p. A-7, July 9, 1992.]

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STS 46: RSS SURROUNDS ATLANTIS

At Launch Complex 39B, workers have completely surrounded Atlantis with the rotating service structure and connected the Orbiter midbody umbilical unit (OMBUU) to the Orbiter. The payload bay doors have been opened for payload installation; the KSC Launch Readiness Review has been completed. No significant problem issues were addressed at the LRR and all KSC elements are pressing forward to the next Shuttle launch. The installation of the Tethered Satellite System and the EURECA payload is underway at the pad. Interface verification testing will begin tomorrow at LC39B; the Flight Readiness Review is scheduled at KSC for July 10. The target date for the flight is July 30. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 8, 1992.]

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STS 47/SPACELAB-J: ENDEAVOUR

While in Orbiter Processing Facility 3, Endeavour continues to undergo preparations to install the Spacelab-J payload. Other work in progress: transfer of Endeavour's forward reaction control system from the Hypergolic Maintenance Facility to the OPF; functional tests of the orbital maneuvering system pod; leak and functional tests of the auxiliary power units and inspections of the payload bay doors. This weekend Spacelab-J will be installed; the FRCS is scheduled for installation July 9. Discovery remains in OPF Bay 2 where it is being processed for its STS 53 mission; work in progress: testing of the right orbital maneuvering system pod; preparations to service the hydraulic system; inspections of the main propulsion system and flushing of the ammonia system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 8, 1992.]

July 9:

STS 50 STATUS/4:10 A.M. EDT

Weather conditions for a landing at Edwards AFB this morning are marginal with a forecast of "no go." Concerns include the possibility of rain within 30 nautical miles and mid-level cloud decks. At KSC the only weather concern was the possibility of ground fog and reports from a weather aircraft indicate that visibility will not be a problem. Winds should be at a low level out of the southwest. Based on current conditions, a landing would be made on Runway 33. This call would be made on lightning considerations as wind conditions are not now a factor. A landing convoy with Orbiter servicing equipment and about 150 personnel is in place at the KSC Shuttle Landing Facility to support a landing here. The deorbit burn for a 7:43 a.m. EDT landing at KSC would be made at 6:47 a.m. A decision on the landing site is not expected until between 5:45 and 6 a.m. This morning's landing opportunity at Edwards AFB is one orbit later than that at KSC. The deorbit burn would be made at 8:11 a.m. EDT for a landing at 9:09 a.m. This would be at 6:09 a.m., local time, approximately 23 minutes after sunrise. Astronaut Kenneth S. Reightler Jr. radioed the crew: "It looks like Mother Nature is giving you a chance to get a tighter grip on your record;" Columbia's STS 50 mission is the longest Shuttle flight to date. If both landing sites should be unavailable, Columbia has enough supplies to stay in orbit safely for two more days. The astronauts serenaded Mission Control with a chorus from the 1960 hit "Stay." They sang: "Oh pleeeeeease, stay a little bit longer." Mission Control had played the song for them the day before when the crew was informed that an extra day had been added to their flight. ["Status of STS-50/Columbia," July 9, 1992; Brown, FLORIDA TODAY, p. 1A, July 9, 1992.]

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COLUMBIA LANDS AT KSC

"Congratulations on the longest Shuttle flight on record. Thanks for helping to pave the way to Space Station operations," said astronaut Kenneth S. Reightler Jr. to the STS 50 crew from Mission Control (Houston, TX). Columbia's record-breaking-duration flight ended today with a landing at 7:43 a.m. EDT on KSC's Shuttle Landing Facility Runway 33. Today's landing marked the first time Columbia returned from space to Kennedy Space Center and was the 10th Shuttle landing at the launch site. Weather conditions in California were unacceptable for landing today. The Orbiter touched down at about 2,800 ft. mark on the runway and stopped at the 13,000 ft. mark. Total mission elapsed time was 13 days, 19 hours, 30 minutes, and 4 seconds. Columbia's deorbit burn occurred on orbit 220 at 6:41 a.m. EDT and lasted about 3 minutes, 24 seconds. Columbia completed 221 revolutions around the Earth and logged 5,758,000 miles during this flight.

At the conclusion of the flight, Commander **Richard N. Richards** spoke for the crew: "We're looking forward to seeing our families - who unfortunately were not able to change landing sites as quickly as we were and will be waiting for us when we get back to Houston tonight. It's been a long day, particularly for our crewmates who had put in a full shift closing out Spacelab before we left orbit, so we need to get everyone home for some rest as soon as possible." KSC Director **Robert L. Crippen** said that the crew was in good spirits and showed no ill effects from their extended flight. "It was a completion of a great mission. The vehicle has come back looking outstanding; the crew is all looking good and very excited," he said. Crippen also noted that after the rear wheels of Columbia touched down at KSC, the nose wheel stayed up a few seconds longer than usual - 18 seconds - to make sure the nose came down gently; the concern was due to the 23,000-pound laboratory in the payload bay.

The STS 50 flight crew was scheduled to depart at 2:30 p.m. today from the skid strip at Cape Canaveral Air Force Station. They will be flying to Ellington Field, TX, near the Johnson Space Center (Houston, TX). KSC's landing and recovery team is preparing Columbia for tow to Orbiter Processing Facility Bay 1 later today. One of the tires on the main landing gear will be removed while the vehicle is on the runway for immediate shipment to the vendor for analysis. This is the first flight of the new beefed-up tires which use a synthetic rubber tread instead of the natural rubber previously used. Kennedy Space Center Director Crippen said that a safety rule limiting planned Florida landings to Orbiters weighing 205,000 pounds or less would be discarded if the new tires work as designed. "The heavy weight didn't bother me at all. We do not have to get through the full evaluation on the tires," he said, adding that a quick inspection showed little damage to Columbia's landing gear. [KSC SHUTTLE STATUS REPORT, 11 a.m., July 9, 1992; "Post Flight Statement by STS 50 Commander Dick Richards," July 9, 1992; Halvorson, FLORIDA TODAY, p. 1A, July 10, 1992; "New Attitude," FLORIDA TODAY, p. 1A, July 10, 1992; "In Florida," USA TODAY, p. 4A, July 10, 1992; "Longest Shuttle Flight Ends With Florida Landing," THE NEW YORK TIMES, p. A7, July 10, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-10, July 10, 1992.]

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STS 46: TSS/EURECA INSTALLED

At Launch Complex 39B, the Tethered Satellite System and EURECA payloads have been installed in the cargo bay of Atlantis; the Orbiter's STS 46 mission is now targeted for no earlier than August 1. Interface verification tests between the EURECA payload and the Orbiter are underway. The Flight Readiness Review for STS 46 begins July 11. [KSC SHUTTLE STATUS REPORT, 11 a.m., July 9, 1992; Halvorson, FLORIDA TODAY, p. 4A, July 10, 1992.]

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ENDEAVOUR/DISCOVERY PROCESSING

In OPF Bay 3, Endeavour is being mated with its forward reaction control system and preparations are underway to install the Spacelab-J payload this weekend. Leak and functional tests of the auxiliary power units have begun as have inspections of the payload bay doors with the doors in a closed position. Discovery, located in OPF Bay 2, is having its right orbital maneuvering system pod tested. Preparations are underway to service the Orbiter's hydraulic system and to inspect the main propulsion system. [KSC SHUTTLE STATUS REPORT, 11 a.m., July 9, 1992.]

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MARS OBSERVER MILESTONE

The Mars Observer spacecraft passed another major milestone toward launch in September when it was transported from Hangar AO on Cape Canaveral Air Force Station to the Payload Hazardous Servicing Facility (PHSF) on the Kennedy Space Center. Mars Observer has been at Hangar AO undergoing testing of its instruments, communications and spacecraft systems since it arrived at the Cape on June 19. At the PHSF, the next major activity will be to fuel the spacecraft with its orbit insertion and attitude control propellants. This will be followed by mating to the Transfer Orbit Stage (TOS) which is currently scheduled to occur on August 2. This is the upper stage that will provide the final thrust to propel the spacecraft on its 11-month journey to Mars.

After the TOS has also been fueled with its control propellant, there will be integrated testing of the two flight elements, followed by encapsulation in the nose fairing. The Mars Observer/TOS combination is scheduled to be moved to Launch Complex 40 for mating with the Titan III Launch Vehicle on August 17. Mars Observer will be the first U. S. mission launched to Mars since the Viking program in 1975. From a circular Martian polar orbit of 250 miles it will conduct a comprehensive study for one Martian year, or 687 Earth days, mapping the surface and profiling the atmosphere. The liftoff of Mars Observer is scheduled for September 16 at the opening of a launch window which extends from 1:02 p.m. EDT until 2:34 p.m. EDT. [NASA/KSC News Release No. 89-92, July 9, 1992.]

July 10:

INTERFACE TESTS FINISHED

At Launch Complex 39B, technicians have completed interface verification tests between Atlantis and its EURECA payload and its remote manipulator system. The Flight Readiness Review for the STS 46 mission is underway. Interface verification tests between Atlantis and its Tethered Satellite System payload will be completed this weekend. Ordnance operations begin July 13 with the launch set for no earlier than August 1. [KSC SHUTTLE STATUS REPORT, 11 a. m., July 10, 1992.]

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COLUMBIA TOWED TO OPF

Columbia, just returned from its 14-day STS 50 mission, has been towed from the Shuttle Landing Facility to the OPF; that occurred at 1 p.m. yesterday. OPF workers are now offloading experiments from the middeck; gaining access to various parts of the Orbiter and connecting purge equipment to the vehicle. Shortly technicians will begin offloading residual cryogenic propellants from Columbia. [KSC SHUTTLE STATUS REPORT, 11 a. m., July 10, 1992.]

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ENDEAVOUR/DISCOVERY PREPARATIONS

In OPF Bay 3, technicians are preparing to install Endeavour's Spacelab-J payload on July 13; cycling the payload bay doors and conducting leak and functional tests of the main propulsion system. Endeavour has been mated with its forward reaction control system in preparation for its upcoming STS 47 mission. In OPF Bay 2, Discovery is being readied for its STS 53 mission. Technicians are conducting leak checks of the auxiliary power units; testing the right orbital maneuvering system pod and preparing to service the Orbiter's hydraulic system. [KSC SHUTTLE STATUS REPORT, 11 a. m., July 10, 1992.]

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STS 46: JULY 31 LAUNCH: IT'S OFFICIAL

NASA managers today announced July 31, 1992, as the official launch date for Shuttle Mission STS 46. Atlantis will carry two international payloads - the Tethered Satellite System (TSS-1), a project jointly developed by NASA and the Italian Space Agency and the European Carrier (EURECA) payload which was developed by the European Space Agency. The launch window on the 31st opens at 9:56 a.m. EDT and extends for 2 1/2 hours. Atlantis will be commanded by USAF Col. Loren J. Shriver, making his third Shuttle flight. Marine Corps Major Andrew M. Allen will serve as pilot, making his first flight. Mission Specialists will include Claude Nicollier, a European Space Agency astronaut making his first Shuttle flight; Marsha S. Ivins, making her second Shuttle flight; Jeffrey A. Hoffman, making his third space flight; and Franklin R. Chang-Diaz, making his third space flight. Franco Malerba from the Italian Space Agency will be a payload specialist aboard Atlantis. STS 46 will be the 12th flight of Space Shuttle Atlantis and the 49th flight of the Shuttle system overall. [Note to Editors: NASA Sets Launch Date for Next Shuttle Mission, 6:00 p.m., July 10, 1992.]

July 12:

ATLANTIS: ROUTINE PROCESSING

At Launch Complex 39B this weekend, workers have been testing connections between Atlantis and its Tethered Satellite System payload. Ordnance operations, in two phases, have begun at the pad with the hazardous part being scheduled for late tonight. There will be few other pre-launch activities scheduled due to the delay in launching Atlantis because of conflicts with other unmanned missions. Flight control teams and the STS 46 crew are undergoing additional training during this period. [Banke, FLORIDA TODAY, p. 2A, July 12, 1992.]

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HYDROSTATIC BEARINGS/NEW DESIGN

Rocketdyne has come up with a new type of bearing that would solve a serious shortcoming with the bearings now in use in the turbopumps now on the Space Shuttles. The invention comes too late for inclusion on Atlantis. Rocketdyne President Robert Paster said, "We've been looking at a totally new concept in bearings." The new concept eliminates the need for "ball bearings" and replaces them with a thin film of liquid oxygen in a uniquely-shaped chamber; they would operate similarly to the way "air bearings" do in a dentist's drill. Hundreds of tests will be required before a Shuttle will fly with the new bearings, but NASA has been impressed and NASA will consider the hydrostatic bearings for the new Space Transportation Main Engine which has been proposed to lift the National Launch System rockets after the year 2000. [Banke, FLORIDA TODAY, p. 10E, July 12, 1992.]

July 13:

SR 3: WORK BEGINS JAN. 1993

Brevard County will resume work on widening State Road 3 north of the Barge Canal in January 1993. The widening project was initially delayed because the county failed to purchase all the needed right of way. Much of the land was acquired in March 1992 in a court hearing, but some of the prices to be paid have yet to be negotiated and the county must also now acquire more land for drainage retention. Working with KSC, Sea Ray Boats Inc., the Coast Guard, the Brevard County School Board, the Florida Department of Transportation, Commissioner Karen Andreas and the County Commission, a number of changes and improvements have been decided upon. The SR 3 Barge Canal will now open earlier starting today at 5:00 a.m., rather than at 6:00 a.m. Other

changes include: synchronizing traffic lights near SR 3, SR 528 (the Bee Line) and Sea Ray Boats Inc.; reducing the number of school bus routes north of the bridge and altering schedules of some Sea Ray workers. [Reitz, FLORIDA TODAY, p. 1A, July 13, 1992.]

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SPACELAB INSTALLED IN ENDEAVOUR TODAY

At Kennedy Space Center today, technicians in Orbiter Processing Facility Bay 3 will begin to install a Spacelab module in Endeavour. This module is called Spacelab J and will contain more than 50 material and life science experiments. Endeavour's STS 47 mission is targeted for mid-September and will be jointly sponsored by Japan and the United States. [Brown, FLORIDA TODAY, p. 3A, July 13, 1992.]

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STS 46: ORDNANCE OPERATIONS

Ordnance operations for STS 46 were completed earlier today at Launch Complex 39B where Atlantis awaits a July 31 launch. The Flight Readiness Review which was completed July 10 set the target date for launch. Interface verification tests between the Orbiter and its payloads - TSS-1 and EURECA - have been completed. Work in progress: close outs of the Orbiter's aft compartment and checks of the mobile launcher platform liquid oxygen system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 13, 1992; "KSC Wraps Up 1st Part of Task to Install Ordnance on Atlantis," FLORIDA TODAY, p. 2A, July 14, 1992.]

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STS 50: POST-LANDING WORK

Technicians in OPF Bay 1 have offloaded residual cryogenic propellants from Columbia which landed at Kennedy Space Center on July 9. Experiments have been removed from Columbia's middeck and the Orbiter's main engine bearings have been dried. Work in progress: installing platforms in the aft compartment; attaching strongbacks to the payload bay doors and removal of the waste containment system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 13, 1992.]

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ENDEAVOUR/DISCOVERY: OPF WORK

Functional tests of Endeavour's right orbital maneuvering system pod have been completed in OPF Bay 3. Work in progress: functional tests of the forward reaction control system; connections of the radiators; preparations to install the Spacelab J payload; leak and functional tests of the main propulsion system. The Spacelab J payload will be installed July 14. Discovery is undergoing tests of its Ku-band antenna during processing in OPF Bay 2; other work includes leak checks of the galley water lines and preparations to service the hydraulic system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 13, 1992; KSC Wraps Up 1st Part of Task to Install Ordnance On Atlantis," FLORIDA TODAY, p. 2A, July 14, 1992.]

July 14:

SPC EXTENSION FOR LOCKHEED

NASA's John F. Kennedy Space Center (KSC), FL, has extended for 3 years its Space Shuttle Processing Contract (SPC) with Lockheed Space Operations Co. (Titusville, FL). The 3-year extension, through Sept. 30, 1995, is valued at \$1,830,915,860. The original contract was awarded Sept. 23, 1983, and provided for a 3-year period of performance and four 3-year options. "All of us at Lockheed are very, very pleased with the extension," said company spokesman J. B. Klump. Kennedy Space Center spokesman Karl

Kristofferson said, "The three-year extension is an indication that NASA is pleased with Lockheed's performance as Shuttle Processing Contractor." The current extension exercises the third of these options. The present contract value for the 9-year period since the contract was competitively awarded in 1983 is \$6,298,810,414. The contract extension will be performed under a cost-plus-award-fee agreement. Lockheed's responsibilities include complete processing services including preparation of the Space Shuttle vehicle for each unique mission and checkout, launch, landing and recovery operations. Lockheed also is responsible for operation and maintenance of related processing facilities and ground services at KSC. [NASA/KSC News Release No. C92-8, July 14, 1992; Halvorson, FLORIDA TODAY, pp. 1A-2A, July 16, 1992.]

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ATLANTIS: PRE-LAUNCH PROGRESS

At Launch Complex 39B, technicians are closing out the aft compartment of Atlantis in preparation for its July 31 STS 46 mission and are closing out the solid rocket booster hold down posts. Work scheduled: installation of two contingency space suits in the airlock next week; purges of the external tank; installation of doors on the aft compartment for flight; start of the countdown at 4:00 p.m. EDT on July 28; launch on the 31st is set for 9:56 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 15, 1992.]

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SPACELAB J LOADED INTO ENDEAVOUR

"This is certainly one of the major milestones in the processing facility," said KSC spokeswoman Lisa Malone about the installation of Spacelab J in Endeavour's cargo bay for its mid-September STS 47 mission; the job was finished at 5:36 p.m. EDT. The mission will include Mission Specialist Mamoru Mohri, the first Japanese astronaut to fly on the Shuttle. Work in progress: electrical connections of Spacelab J; servicing Spacelab J cooling lines; installation of Tacan No. 3 antenna; functional tests of the forward reaction control system; leak and functional tests of the main propulsion system. Endeavour will be moved to the Vehicle Assembly Building in mid-August for mating with its external tank and solid rocket boosters. At Launch Complex 39B, technicians continued to ready Atlantis for its STS 46 mission, now scheduled to launch on July 31. Aft compartment tests are expected to be completed next week. [Halvorson, FLORIDA TODAY, p. 2A, July 15, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 15, 1992.]

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POST STS 50 PROCESSING FOR COLUMBIA

The Space Shuttle Columbia has had its payload doors opened and functional tests have been performed. Now in OPF Bay 1, technicians are underway with preparations of Columbia to deservice residual hypergolic propellants and inspections of the radiators. Later this week, workers will remove the United States Microgravity Laboratory-1 from Columbia's cargo bay. Discovery, in OPF Bay 2, is being prepared for the installation of its left orbital maneuvering system (OMS) pod; leak and functional tests of the main propulsion system; filling and bleeding of the hydraulic system and testing of the right OMS pod. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 15, 1992.]

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CAL-STAR, INC. WINS KSC CONTRACT

Cal-Star Co., Inc. (Titusville, FL) has been awarded a \$161,890 contract to construct an addition to a heavy equipment maintenance building at Kennedy Space Center. Work for the construction of a heavy equipment high bay addition to Building K6-1995 is expected to begin during the week of July 27, 1992. Under the terms of the fixed price contract,

the small business firm will have 150 days from the start date to complete the project. The facility is located on the east side of Contractors Road in the Heavy Equipment Shop Maintenance section of the Launch Complex 39 area. The 2,750-square-foot high bay will be used to service heavy equipment in support of Space Shuttle Launch Complexes 39A and 39B. The van used to transport Shuttle mission crews from the Operations and Checkout Building to the launch pad prior to liftoff is also serviced in the area. [NASA/KSC News Release No. 91-92, July 14, 1992.]

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MIMS FIRM GETS KSC CONTRACT

Oneida Construction Co. (Mims, FL) has been awarded a \$138,417 contract to construct storage at Kennedy Space Center for a Solid Rocket Motor (SRM) Transporter. Work on this fixed price contract is scheduled to begin June 15, 1992. The small business firm will have 110 days after startup to complete the requirements of the contract. The work includes the erection of a 3,044-square-foot prefabricated shelter for the truck-like transporter on the north side of the Crawler-Transporter Building near the Vehicle Assembly Building (VAB). The SRM Transporter is used to move fueled Space Shuttle solid rocket motor segments that arrive at the Rotation, Processing and Surge Facility (RPSF) by rail to High Bays 1 and 3 in the VAB. The four segments of each of two boosters, along with their aft skirts, frustums and nose cones, are assembled atop a Mobile Launcher Platform. Then the Shuttle's external tank is mated to the completed boosters. When the Shuttle Orbiter is mated to the external tank, the fully assembled space vehicle is ready to be transported to Launch Complex 39A or 39B atop the Crawler-Transporter. [NASA/KSC News Release No. 92-92, July 14, 1992; "Mims Company Wins Contract," FLORIDA TODAY, p. 10E, July 19, 1992.]

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HOLLY HILL FIRM WINS SPACE STATION CONTRACT

Dan Rice Construction Co., Inc. (Holly Hill, FL) has been awarded a \$6,958,220 contract to build the Hazardous Processing Facility (HPF) at Kennedy Space Center which will be used to process the propulsion assemblies that provide the thrust to allow Space Station Freedom to maintain its orbit and attitude. The new facility will replace the existing Payload Spin Test Facility. Work covered by the firm fixed price contract is to begin October 1, 1992, and be completed within 14 months. It includes the labor, equipment and materials to construct the HPF next to the Payload Hazardous Servicing Facility (PHSF) in the KSC Industrial Area. Under this agreement, the contractor will also expand the Hazardous Operations Support Facility (HOSF), a prefabricated building near the HPF, PHSF and other KSC facilities where Space Shuttle payloads that require hazardous operations can be processed.

The HPF will feature a 1,800-square-foot high bay with an environmentally-controlled atmosphere to prevent contamination of the Space Station flight hardware during inspection, checkout and other processing activities prior to integrating the propulsion assemblies into the Space Shuttle Orbiter's payload bay. An adjoining 9,000-square-foot low bay area will provide storage space for one propulsion assembly, servicing equipment and offices. Hazardous operations that will take place in the HPF include the loading of hydrazine propellant and other types of toxic or otherwise harmful gases and fluids into propulsion assembly tanks. Ventilation systems and safety devices in the HPF will protect KSC processing personnel from harm. Should the need arise, the HPF could also be used to process other types of space hardware that require this type of service. Kennedy Space Center will be responsible for the prelaunch processing of all Space

Station Freedom flight hardware and its launch into orbit. [NASA/KSC News Release No. 90-92, July 14, 1992; Halvorson, FLORIDA TODAY, p. 9E, July 19, 1992.]

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LSO WINS GOLDIN'S WORLD CLASS AWARD

Administrator Daniel S. Goldin recently presented NASA's first awards for "World Class" performance. Kennedy Space Center's Shuttle Processing Contractor Lockheed Space Operations Co. (Titusville, FL) was one of two award winners; the other was Rockwell International's Space Systems Division (Downey, CA). Gerald Oppfeger, Lockheed president, accepted the award which was given for outstanding work in processing Orbiters for flight. ["Two Contractors Win 'World Class' Awards," FLORIDA TODAY, p. 9E, July 19, 1992; "Shuttle Team Gets Highest Award," FLORIDA TODAY, July 12, 1992.]

July 16:

STS 46: PAD PROCESSING OF ATLANTIS

A number of pre-launch activities are underway at Launch Complex 39B in preparation for the STS 46 mission of Atlantis: close outs of the aft compartment; final inspections of the base heat shield thermal protection system; testing of the environmental monitoring package on the EOIM experiment. Officials said yesterday that a minor problem with an experiment package in the cargo bay will not stall launch plans. KSC spokeswoman Lisa Malone, referring to an erratic sensor in the experiment, said, "We can't get an indication that it's on or off. We are going to try to see what's causing the problem and then fix it." The problem is described as minor. Work scheduled: installation of two contingency space suits in the airlock next week; purges of the external tank; installation of doors on the aft compartment for flight, next week; beginning of launch countdown at 4 p.m. EDT July 28; launch of STS 46 at 9:56 a.m. EDT on July 31, 1992. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 16, 1992; Halvorson, FLORIDA TODAY, p. 2A, July 16, 1992.]

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STS 47: ENDEAVOUR IN OPF BAY 3

Functional tests of Endeavour's forward reaction control system have been completed; the Orbiter is undergoing processing activities in OPF Bay 3. Work in progress: servicing Spacelab J cooling lines; preparations to service freon coolant loop No. 1; testing of the Ku-band antenna; leak and functional tests of the main propulsion system. Work scheduled: interface verification test between Spacelab J and Endeavour; installation of the three main engines next week. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 16, 1992.]

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COLUMBIA/DISCOVERY OPF PROCESSING ACTIVITIES

The Space Shuttle Columbia (OV 102) is being readied for its STS 52 mission in OPF Bay 1. Work in progress: preparations to remove the USML tunnel; preparations to deservice residual hypergolic propellants; inspections of the radiators; post-flight inspections of the windows and main engines. Removal of the United States Microgravity Laboratory-1 is scheduled for this weekend. Discovery (OV 103) is in Orbiter Processing Facility Bay 2 undergoing leak checks of the auxiliary power unit system; preparations to install the left orbital maneuvering system (OMS) pod; leak and functional tests of the main propulsion system; filling and bleeding of the hydraulic system; testing of the right OMS pod. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 16, 1992.]

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STS 46: PROBLEMS SOLVED

An electronics assembly in an experiments package was found to be the cause of a payload problem in Atlantis; the problem unit was removed for repairs, officials said, and Atlantis remains on schedule for launch July 31. The repairs to the electronics assembly will be carried out in the Operations & Checkout (O&C) Building in the KSC Industrial Area. When repairs are complete, the unit will be reinstalled in the experiment package next week and tested. Technicians also removed a faulty computer monitor aboard Atlantis; the unit will be replaced by launch pad technicians, according to KSC spokeswoman Lisa Malone. Crew members recently discovered that the monitor's brightness may not be up to standards. Both problems were considered minor and no impediment to an on-schedule launch. of STS 46. [Halvorson, FLORIDA TODAY, p. 6A, July 17, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 17, 1992.]

July 17:

STS 46: PRE-LAUNCH WORK CONTINUES

At Launch Complex 39B, pre-launch work continues on Atlantis: closeouts of the aft compartment; cleaning of the aft compartment; inspections of the thermal protection system base heat shield; installation of the hold down post blast shield. Work scheduled: installation of two contingency space suits in the airlock; purges of the external tank; installation of doors on the aft compartment for flight next week. No work is scheduled this weekend at the pad, according to KSC spokeswoman Lisa Malone. "Just about everyone has the weekend off," she said. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 17, 1992; Banke, FLORIDA TODAY, p. 2A, July 18, 1992; Banke, FLORIDA TODAY, p. 1A, July 19, 1992.]

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ENDEAVOUR: DRAG CHUTE INSTALLED

In preparation for its second mission - STS 47 - technicians in OPF Bay 3 have installed the Orbiter's drag chute. Work in progress: servicing Spacelab-J cooling lines; preparations to service freon coolant loop No. 1; testing of the Ku-band antenna; leak and functional tests of the main propulsion system. Work scheduled: interface verification test between Spacelab-J and the Orbiter will occur this weekend; installation of the three main engines next week. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 17, 1992.]

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COLUMBIA: PAYLOAD OPERATIONS RECORDER DUMPED

In Orbiter Processing Facility Bay 1, technicians are processing Columbia which has just returned from its STS 50 mission. The Payload Operations Recorder has been dumped and the United States Microgravity Laboratory-1 was removed yesterday. The USML-1 arrived at the Operations & Checkout Building at 11:45 a.m. today. Work in progress: preparations to deservice residual hypergolic propellants; inspections of the radiators; post-flight inspections of the windows and main engines. In OPF Bay 2, technicians are processing Discovery and are engaged in these activities: tests of the waste containment system; leak checks of the auxiliary power unit system; preparations to install the left orbital maneuvering system (OMS) pod; leak and functional tests of the main propulsion system; filling and bleeding of the hydraulic system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 17, 1992; Banke, FLORIDA TODAY, p. 2A, July 18, 1992.]

July 20:

ENDEAVOUR GETS ENGINES TODAY

In OPF Bay 3, workers will begin installing Endeavour's engines; meanwhile workers at Launch Complex 39B continue to prepare Atlantis for its July 31 launch of the STS 46 mission. Closeouts of Atlantis's rear engine compartment begin today as well as stowing two spacesuits in the Orbiter's airlock. [*KSC to Install Engines on Endeavour Today," FLORIDA TODAY, p. 4A, July 20, 1992.]

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STS 46: PRE-LAUNCH ACTIVITIES

Close outs of the aft compartment and avionics bays of Atlantis are underway at Launch Complex 39B in preparation for the July 31 liftoff of STS 46. Other work in progress: cleaning of the aft compartment; power up testing; retest of the pilot's CRT monitor; installation of two contingency space suits in the airlock. Work scheduled: purges of the external tank; installation of the doors on the aft compartment for flight next week. The launch countdown for STS 46 begins at 4 p.m. on July 28 with liftoff coming at 9:56 a.m. EDT July 31. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 20, 1992.]

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SPACELAB-J TESTS COMPLETED/ENDEAVOUR

In Orbiter Processing Facility Bay 3, technicians have completed interface verification tests between Spacelab-J and Endeavour; the Spacelab tunnel was installed yesterday and freon coolant loop No. 1 was serviced. Work in progress: installation of the three main engines for STS 47; preparations for crew equipment interface test; hookups of the waste containment system; securing the right hand wheel to the landing gear. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 20, 1992.]

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COLUMBIA/DISCOVERY PROCESSING

Residual hypergolic propellants have been drained from Columbia this weekend in OPF Bay 1 where the Orbiter is being processed for its STS 52 mission. Work in progress: disconnecting equipment used to deservice hypergolic propellants and removing thermal blankets around the extended duration Orbiter (EDO) pallet. The pallet is scheduled to be removed July 22. Discovery continues processing activities looking toward its STS 53 mission for the Department of Defense. In the Hypergolic Maintenance Facility tests are underway on Discovery's forward reaction control system and the left orbital maneuvering system pod. Leak checks are being conducted on the Orbiter's auxiliary power unit system; preparations have begun to install the left orbital maneuvering system (OMS) pod; leak and functional tests of the main propulsion system and filling and bleeding of the hydraulic system have also started. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 20, 1992.]

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GOLDIN: RUSSIAN INITIATIVES

Following a 7-day trip to Russia and the Ukraine, NASA Administrator Daniel S. Goldin today announced plans for the United States and Russia to implement the agreements Presidents Bush and Yeltsin announced on June 17, 1992. The Administrator said significant progress was made in developing a plan to carry out a wide range of projects in concert with the Russian space program, including expansion of cooperation in life sciences and global change research, the exchange of an American astronaut and Russian cosmonaut, and a Space Shuttle rendezvous and docking with the Russian Mir space station. "In our relationship with Russia, we need to start slowly and deliberately

to build a strong foundation of cooperation," Goldin said. "In this way, we will ensure that what we do together will be successful, both technically and scientifically."

Goldin said much had been learned on the interagency trip, which was jointly led by National Space Council Executive Secretary **Brian Dailey**, and which was agreed upon by Vice President Quayle and President Yeltsin in a meeting last month. The delegation included Assistant Secretary of the Air Force **Martin Faga** and representatives from the National Security Council, State Department and the Central Intelligence Agency. "The delegation had the opportunity to take a closer look at Soyuz-TM, the Russian Docking System and at their human spaceflight operation," Goldin said. "We also learned a lot about the capabilities of the Mir space station and discussed ways to expand critical life sciences and global change research."

Goldin said both the United States and Russia agreed to encourage private companies to expand their research for new commercial space business and agreed to facilitate appropriate contacts. Both countries also agreed that the docking mission planned in 1994 with Russia would highlight biomedical science. NASA and the Russian Space Agency agreed - pending an appropriate review and approval of the governments of the two countries - to continue the activities now underway by the five working groups established under the 1987 joint agreement with the Russian Academy of Sciences. Additional initiatives will be undertaken by the Working Group of Space Biology and Medicine which will now concern itself with life support systems.

The agreement also that the parties:

- ** study the possible use of Mir for long lead-time life sciences research;
- ** establish a new working group to develop a plan to enhance cooperation on global change research (Mission to Planet Earth);
- ** recommend cooperative biomedical research projects for future missions, including the missions involving exchange of a Russian cosmonaut and an American astronaut and the Space Shuttle/Mir rendezvous and docking mission;
- ** study the feasibility of further enhancing the biomedical capabilities of Mir using instruments from the U.S.; and
- ** study the possibility of closed-loop life support experiments with humans over different periods of time and to define the requirements for long duration missions.

Goldin said he also discussed the acquisition by the United States of a small Russian lander to carry U.S. experiments that would be one of three landers flown on the Russian Mars '94 mission. The Russian and Ukraine trip followed a series of meetings between President Bush and Yeltsin during the June summit in Washington when they discussed a series of space initiatives. At the summit, Bush and Yeltsin signed the Joint Statement on Cooperation in Space. Goldin and **Yuri Koptev**, Director of the Russian Space Agency, also ratified the 1992 United States-Russian Space Cooperation Agreement. [NASA/KSC News Release No. 92-116, July 20, 1992; "1993 Shuttle May Carry Russian," THE ORLANDO SENTINEL, July 17, 1992; "Officials: Russian May Fly On Shuttle By October '93," FLORIDA TODAY, July 17, 1992.]

July 21:

PILOT'S CRT RETESTED

At Launch Complex 39B, technicians have tested the STS 46 Pilot's replacement monitor. Work in progress on Atlantis: installation of the repaired electronics assembly for the EOIM payload environmental monitoring package; closeouts of the aft compartment and avionics bays; power up testing; retest of the Pilot's CRT; installation of two contingency space suits in the Orbiter's airlock. Work scheduled: purges of the external tank; installation of doors on the aft compartment for flight this week; the start of the launch countdown is still planned for 4:00 p.m. EDT July 28 with launch on July 31 at 9:56 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 21, 1992; Banke, FLORIDA TODAY, p. 2A, July 22, 1992.]

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STS 47: ENDEAVOUR PROCESSING

In Orbiter Processing Bay 3, technicians have installed engine No. 2026 in the number 1 position on Endeavour and aligned the Spacelab tunnel adapter. Work in progress: installing engine No. 2022 in the number 2 position; preparations for crew equipment interface test; hookups of the waste containment system; leak and functional testing of the auxiliary power system; installation of seep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 21, 1992.]

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COLUMBIA: RADIATOR TESTS COMPLETED

In OPF Bay 1, technicians have finished functional tests of Columbia's radiators and will be removing the extended duration Orbiter (EDO) pallet on July 22. Presently, workers are removing thermal blankets around the EDO; removing heat shields and removing window number 4. Meanwhile, in the Hypergolic Maintenance Facility, technicians are conducting tests of Discovery's forward reaction control system and the left orbital maneuvering system pod. In OPF Bay 2, workers are conducting leak checks of the auxiliary power unit system; preparing to install the left orbital maneuvering system (OMS) pod on July 23; leak and functional tests of the main propulsion system; hydraulic system testing; leak checks of the galley; painting areas of the midbody. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 21, 1992.]

July 22:

STS 46: SPACE SUITS INSTALLED

Two contingency space suits have been installed in the airlock of Atlantis as it awaits launch at Launch Complex 39B; workers have also installed baggies on the engine low pressure fuel ducts. Work in progress: stowing equipment in the crew module; retest of the repaired electronics assembly for the EOIM payload environmental monitoring package; closeouts of the aft compartment and the avionics bay of Atlantis. Work scheduled: purges of the external tank; final ordnance operations on July 24; installation of aft compartment doors on July 23; countdown scheduled to begin at 4:00 p.m. July 28 and the STS 46 crew arrives at 7:30 p.m. Launch remains slated for July 31 at 9:56 a.m. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 22, 1992.]

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ENDEAVOUR: MAIN ENGINES INSTALLED

In preparation for its upcoming STS 47 mission, Endeavour has had its three main engines installed during processing activities in OPF Bay 3. Work in progress: connections of the three main engines; preparations to install the Spacelab tunnel; preparations for crew equipment interface test; leak and functional testing of the auxiliary

power units; installation of sleep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 22, 1992.]

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STS 52/53 PROCESSING ACTIVITIES

The Space Shuttle Columbia is being processed in OPF Bay 1. Work in progress: removing the extended duration Orbiter (EDO) pallet; removal of heat shields; removal of window no. 4. Discovery, located in OPF Bay 2, also has a number of processing activities underway: tests of the forward reaction control system and the left orbital maneuvering system pod; leak and functional tests of the main propulsion system; hydraulic system testing; leak checks of the galley; painting areas of the midbody. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 22, 1992.]

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ELECTRONICS ASSEMBLY PASSES RETEST

At Launch Complex 39B, a repaired electronics assembly in an experiment package passed its retest; the experiment is stored aboard Atlantis for its STS 46 flight. Last week, engineers were not able to determine whether the device was turning on or off properly. KSC spokeswoman Lisa Malone said today that the part had been cleared for the July 31 flight if Atlantis. Halvorson, FLORIDA TODAY, p. 8A, July 23, 1992.]

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GEOTAIL LAUNCH

"We're right on schedule," said Jim Womack, NASA's Director of Unmanned Launch Vehicle Operations at Kennedy Space Center. The launch of the Geotail spacecraft aboard a Delta II rocket is scheduled for Friday, July 24. The launch window - only five minutes in duration - extends from 10:26 to 10:31 a.m. EDT. [NASA/KSC News Release No. 96-92, July 22, 1992; Banke FLORIDA TODAY, p. 1A, July 24, 1992; "Delta 2 Blasts Off," FLORIDA TODAY, pp. 1A & 6A, July 25, 1992.]

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GOLDIN MEMO TO NASA EMPLOYEES

You may have read or heard about an article that recently appeared in the media, falsely claiming there is a plan to make 500 high level reductions in the workforce (RIFs) at NASA headquarters on August 1, 1992. For the record, the news article is completely false. I believe it may have originated from proposed legislation in Congress to reduce NASA's Research and Program Management (R & PM) funding for FY 1993. I was asked at a press conference to comment on the news story and responded forcefully: "That (the news story) is absolutely, positively not true. I don't know who came up with that, but they are off on a tangent. There are not plans to have a RIF at NASA headquarters and this Administrator is going to fight to retain a reasonable amount of R & PM funds so we don't have to have a RIF." [Goldin, "Memorandum to All NASA Employees," July 22, 1992.]

July 23:

PCC TO BE DEDICATED

NASA's Kennedy Space Center will next week host a dedication ceremony for the recently constructed Space Shuttle Processing Control Center (PCC). The event will take place at 9 a.m. July 29. The PCC is a three-story, 99,000-square-foot facility dedicated to Space Shuttle Orbiter testing, launch team training and Launch Processing System (LPS) maintenance. The building houses control rooms for Orbiter processing and will provide

Space Shuttle engineers and technicians with state-of-the-art areas to improve and maintain their skills during pre- and post-flight Orbiter processing flows.

Each of the PCC's three floors is designed to serve a specific purpose. The facility's first floor consists of offices, workshops and laboratories for the maintenance and testing of LPS and related equipment. The second floor contains additional office space and areas for launch team training and computer software production. Orbiter control rooms dominate the PCC's third floor. The ceremony's featured speakers will include KSC Director **Robert L. Crippen**, KSC Director of Shuttle Management and Operations **Jay Honeycutt** and **James Towles**, KSC's Director of Facilities Engineering and Project Management. The PCC is located in the Launch Complex 39 area, between the Orbiter Processing Facility and the Operations Support Building. The \$8.9 million building was designed and built by The Haskell Company (Jacksonville, FL); construction of the facility began on May 29, 1991. [NASA/KSC News Release No. 99-92, July 23, 1992.]

July 24:

STS 46: FINAL ORDNANCE OPERATIONS

In preparation for the STS 46 launch, technicians at Launch Complex 39B have completed final ordnance operations, purged the external tank of Atlantis and installed the doors on the aft compartment for flight. Work in progress: closeouts of the payload; closeouts of ordnance areas on the vehicle; stowing equipment in the crew module; launch countdown preparations. Pressurization of the hypergolic propellant tanks for launch has been scheduled. The launch countdown is set to begin at 4 p.m. EDT July 28; the STS 46 crew is expected to arrive at KSC at 7:30 p.m. EDT. Launch remains set for 9:56 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 24, 1992; "KSC to Finish Work on Explosives," FLORIDA TODAY, p. 4A, July 24, 1992.]

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COLUMBIA: WINDOW #6 REMOVED

In OPF Bay 1, technicians have removed the heat shields from Columbia and have removed window number 6. Technicians are inspecting the Orbiter's main engines and making post-STS 50 inspections of the vehicle's radiators. In OPF Bay 1, work in progress for the upcoming STS 47 flight of Endeavour includes: connections of the three main engines; installation of the Spacelab tunnel; preparations for crew equipment interface test; tests of the Ku-band and Tacan antennas; installation of sleep stations. In OPF Bay 2, technicians are preparing to install the left orbital maneuvering system pod in Discovery. Other work in progress: leak and functional test of the main propulsion system; filling and bleeding of the hydraulic system testing; painting areas of the midbody; leak and functional testing of the auxiliary power units. Scheduled: installation of the left orbital maneuvering system pod this weekend and installation of the three main engines starting on August 3. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 24, 1992.]

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ADMINISTRATOR REFORMS PROCUREMENT PROCESS

NASA Administrator **Daniel S. Goldin** today announced a series of procurement reforms to make NASA the model of excellence for the Federal Government and ensure Americans receive the very best value for their tax dollar. "Through a focus on the customer, empowerment, teamwork with our partners in industry, accountability and diversity, we can achieve our goal and serve as a beacon to others," Goldin said in a speech to the National Contract Management Association in Los Angeles. Goldin said reforms in NASA's procurement process are necessary because 90 percent of the budget is spent through contracts.

"We must continue to give the American people technical advances, but we must also give them 'best' value for their tax dollar," the Administrator said. "In the future, NASA will not tolerate 300 percent cost overruns, defective spacecraft hardware or the failure to follow work instructions that protect government furnished hardware. Nor will we tolerate schedule slippages. We can't keep letting months turn into years and years into decades." According to Goldin, the current procurement system teaches people to fear making any mistakes. "Everyone involved in the acquisition process is swimming in certifications. Instead, we should be encouraging innovation, creativity and efficiency." He said NASA and contractor personnel will never achieve excellence if they are not given clear lines of responsibility and held accountable for their decisions.

Major changes in the procurement process include:

- *New contracts will be awarded to companies that have demonstrated they are accountable by delivering quality systems that meet cost, schedule and technical requirements; and

- *The amount of the award fee earned will be determined by the end result, namely the quality, timeliness and cost of what is delivered;

- *Contractors will be given greater responsibility for success of a program, and should be given the opportunity for increased award fee if they hold to schedule, keep the program within cost estimates and deliver a satisfactory report.

To determine a contractor performance, Goldin said NASA will soon establish a joint NASA-Industry team to develop a source of 'metrics' or measurements. "Once the metrics are established, NASA will publish the results on a generic basis, without identifying specific contractors. On a semi-annual basis, we will notify each CEO where their company stands," Goldin said. Finally, Goldin said NASA will aggressively promote cultural diversity in the work place and reaching its goal for Small and Disadvantaged Business (SDB) contracts. "As Administrator of NASA, I have made a personal commitment to increasing cultural diversity in the workplace and to increasing the contracting opportunities for small and disadvantaged contracts," Goldin said.

The Administrator said NASA had implemented a range of initiatives to increase the number of SDB contracts, including:

- *SDB considerations are part of NASA's earliest procurement planning, and are emphasized in acquisition strategy meetings or in procurement plans; and

- *In many of NASA's large prime contracts, NASA is establishing firm percentages of the effort to be subcontracted to SDBs and will reward those contractors with special incentive fees when they exceed the SDB requirement.

"Small and disadvantaged businesses need assistance above and beyond set-asides," Goldin said. "In the coming months we will be setting up a new 'minority business resource advisory committee' in NASA to help us bring more SDB contractors into the NASA family," he said. "Each of us as professionals and as citizens has an obligation to help overcome the barriers that divide us as a nation. The Los Angeles riots were visual proof that we must redouble our efforts to help our minority citizens turn their dreams into realities," Goldin concluded. [NASA/KSC News Release No. 92-123, July 24, 1992; NASA/KSC News Release No. 92-123A, July 27, 1992.]

July 25:

ATLANTIS THERMOSTAT FIXED

Workers at Launch Complex 39B today repaired a thermostat located in the aft compartment of the Space Shuttle Atlantis which is awaiting the start of its STS 46 mission on July 31. The thermostat is part of a heater for one of the Orbiter's three APUs. The faulty thermostat was detected after workers had sealed the aft compartment and were conducted a last test of the section, according to Kennedy Space Center spokesman Bruce Buckingham. Officials anticipated no delay in the schedule for launch at 9:56 a.m. EDT July 31. The STS 46 crew includes Commander Loren J. Shriver, Pilot Andrew M. Allen, Mission Specialists Claude Nicollier, Marsha S. Ivins, Jeffrey A. Hoffman and Franklin R. Chang-Diaz and Payload Specialist Franco Malerba of Italy. [Banke, FLORIDA TODAY, p. 2A, July 26, 1992.]

July 26:

TSS-1 HAS ORDNANCE INSTALLED

At Launch Complex 39B, technicians have installed explosive devices on the Tethered Satellite System now located in the cargo bay of Atlantis. The ordnance will enable astronauts aboard the STS 46 mission to deploy the TSS-1, an Italian-made spacecraft which is designed to demonstrate the use of a tether to generate electricity. [Brown, FLORIDA TODAY, p. 1A, July 27, 1992.]

July 27:

STS 46: THERMOSTAT RETESTED

Workers re-entered the aft compartment of Atlantis July 25 to replace and retest a heater thermostat for auxiliary power unit number 3. The flight doors were re-installed on the aft compartment for flight July 26; batteries were installed for the Tethered Satellite and they hypergolic propellant tanks were pressurized for launch. Work in progress: verifying the hazardous gas detection system at Launch Complex 39B; closeouts of the payload; stowing equipment in the crew module; launch countdown preparations; washdown of the pad surface and flame trench. The countdown for STS 46 is set to begin at 4 p.m. EDT tomorrow and the crew will arrive later, at about 7:30 p.m. NASA spokeswoman Lisa Malone said, "The team spent several months getting Atlantis ready to fly. We're going to be real excited getting into the countdown, and we're really looking forward to launch on Friday. Launch remains targeted for July 31 at 9:56 a.m. EDT. NASA Lead Flight Director Charles "Chuck" Shaw said, "This will probably be the most unique mission we've ever flown on the Space Shuttle, and arguably the most complex mission that we've ever flown. This mission has provided us with an awful lot of challenges, but I think we've risen to the occasion. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 27, 1992; Halvorson, FLORIDA TODAY, p. 1A, July 28, 1992.]

II

ENDEAVOUR: CEIT COMPLETED

Endeavour's Crew Equipment Interface Test for STS 47 has been completed and the Spacelab Tunnel has been installed in the Orbiter. Work in progress: leak checks of the main engines and main propulsion system; leak tests of the Spacelab Tunnel; inspections of the radiators; installation of the sleep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 27, 1992.]

II

COLUMBIA & DISCOVERY: PROCESSING STATUS

In OPF Bay 1, technicians have deserviced lube oil from Columbia's auxiliary power units and are preparing the Orbiter for removal of the forward reaction control system and for

post-STS 50 inspections of the radiators. In OPF Bay 2, workers have installed Discovery's left orbital maneuvering system pod and deserviced the freon coolant loops. Work in progress on OV 103: installation of main engine number 1; final connections of the left orbital maneuvering system pod; filling and bleeding of the hydraulic system; leak and functional tests of the auxiliary power units. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 27, 1992.]

July 28:

STS 46: LAUNCH MINUS THREE DAYS

As the countdown for STS 46 starts today, NASA Lead Flight Director Charles "Chuck" Shaw said, "This will probably be the most unique mission we've ever flown on the Space Shuttle, and arguably the most complex mission that we've ever flown. This mission has provided us with an awful lot of challenges, but I think we've risen to the occasion. It's probably going to usher in a new way of doing business in Earth Orbit." The STS 46 crew is expected to arrive about 7:30 p.m. tonight. KSC spokeswoman Lisa Malone said, "The team's spent several months getting Atlantis ready to fly. We're going to be real excited getting into the countdown, and we're really looking forward to launch on Friday (July 31)."

The pad surface and flame trench at Launch Complex 39B have been washed down in preparation for the STS 46 launch of Atlantis, July 31. Work in progress: closeouts of the payload and charging the batteries of the EURECA payload; stowing equipment in the crew module; removing covers from the reaction control system thrusters; launch countdown preparations. Work scheduled: closing the payload bay doors for flight at about 5 a.m. July 29; loading of cryogenic reactants into the Orbiter's onboard fuel cell storage tanks in the afternoon of July 29; beginning tanking operation at 1:36 a.m. on July 31; launch at 9:56 a.m. EDT. There is a 90 percent chance of having acceptable weather conditions at the time of launch; the temperature is expected to be 91 degrees and no rain is forecast. [Halvorsen, FLORIDA TODAY, p. 1A, July 28, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 28, 1992; Date, THE ORLANDO SENTINEL, July 29, 1992; Wilford, THE NEW YORK TIMES, pp. B5 & B7, July 28, 1992.]

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ENDEAVOUR: GALLEY TEST COMPLETED

A functional test of Endeavour's galley has been completed as have leak tests of the Spacelab Tunnel. Work in progress: preparation to flush the ammonia system; replacement of the mission elapsed timer; leak checks of the main engines and main propulsion system; functional test of the radiators and installation of the sleep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 28, 1992.]

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STS 52: PREPARATIONS CONTINUE ON COLUMBIA

The Space Shuttle Columbia continues to be processed for its next mission - STS 52. Work in progress: preparations to remove the forward reaction control system; post-STS 50 inspections of the radiators; removing fuel cell No. 2; leak and functional tests of the main propulsion system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 28, 1992.]

□

DISCOVERY: MAIN ENGINE NO. 1 INSTALLED

Main engine number 1 has been installed in Discovery and the left orbital maneuvering system pod has been electrically mated to the Orbiter. Work in progress: installing main engine number 3; tests of the Tacan system; preparations to install the forward reaction

control system; filling and bleeding of the hydraulic system; leak and functional tests of the auxiliary power units. The installation of the No. 3 main engine and the forward reaction control system have been scheduled. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 28, 1992.]

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FIRST PERSONAL COMPUTER CONTRACTS AWARDED

Kennedy Space Center has awarded first-of-a-kind contracts to three firms under NASA's Personal Computer Acquisition Contract Program. Throughout the 5-year life of the contracts, the three companies must compete against each other for NASA orders to supply personal computer (PC) hardware and software to Kennedy Space Center and other NASA locations. The companies are General Technology, Inc. (Costa Mesa, CA); Atlanta Technologies, Inc. (Atlanta, GA); and International Data Products Corp. (Gaithersburg, MD). The contract period of performance is from July 2, 1992, to July 1, 1994, with three additional 1-year optional periods.

Under the terms of the fixed price contract, all three companies will receive portions of a \$37,674,000 award, with a minimum amount of \$180,000 going to each firm. The actual purchases of PC hardware and software depend on which small business company is able to provide the lowest prices and best performance during a quarterly time period. Although vendors may renegotiate current prices every 3 months, they cannot increase prices above the contract negotiated prices and they must furnish current technology items. NASA has established this competitive arrangement so that the agency can be assured of a steady supply of high-quality products for the best price. Kennedy Space Center will purchase computers and software under this contract to be used in a variety of technical and administrative support functions. Other NASA centers and organizations also may order PC equipment and software through the KSC-managed contract. [NASA/KSC News Release No. C92-10, July 28, 1992.]

July 29:

STS 46: LAUNCH MINUS TWO DAYS

The flight crew for STS 46 arrived at Kennedy Space Center yesterday at 9:15 p.m., not quite two hours later than expected. The launch countdown began at 4:00 p.m. as planned. The main engine controllers were powered up for pre-launch tests; the Orbiter's navigation system was activated; preparations were begun to load liquid oxygen and liquid hydrogen reactants into the Orbiter's fuel cell storage tanks. Today the crew performed checks of their flight equipment and were briefed on the status of launch readiness. Commander Loren J. Shriver and Pilot Andrew M. Allen flew in the Shuttle Training Aircraft. Forecasters predicted a 95 percent chance of having acceptable weather conditions at the time of launch on July 31; the temperature is expected to be at 85 degrees with no rain. Work in progress: verification of six electrical connectors between Atlantis and the Tethered Satellite System pallet; removing platforms from the crew module; countdown entered its first hold on time. Work scheduled: closing the payload bay doors for flight this afternoon; loading reactants; activating the Orbiter's communications system; tanking operations beginning at 1:36 a.m. July 31. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 29, 1992; Banke, FLORIDA TODAY, July 29, 1992; Banke, FLORIDA TODAY, July 30, 1992; Banke, FLORIDA TODAY, p. 1A, July 29, 1992.]

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ENDEAVOUR: RADIATOR TEST FINISHED

Endeavour's radiator functional test was completed today; interface testing between the main propulsion system and the main engines was also finished. Work in progress: flushing of the ammonia system; retesting the mission elapsed timer; leak checks of the main engines and main propulsion system; functional tests of the radiators; installation of the sleep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 29, 1992.]

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COLUMBIA: FUEL CELL 2 REPLACED

The number 2 fuel cell of Columbia has been replaced during processing activities in OPF Bay 1. Work in progress: preparations to remove the forward reaction control system; post-flight (STS 50) inspections of the radiators; leak and functional tests of the main propulsion system and replacement of the number 3 fuel cell. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 29, 1992.]

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DISCOVERY: MAIN ENGINES INSTALLED

Workers processing Discovery in OPF Bay 2 have installed the Orbiter's three main engines. Work in progress: connections of the main engines; preparations to install the heat shields around the engines; tests of a thruster on the left orbital maneuvering system pod; preparations to install the forward reaction control system; filling and bleeding of the hydraulic system; leak and functional tests of the auxiliary power units. The forward reaction control system has been scheduled for installation in Discovery. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 29, 1992.]

July 30:

STS 46: LAUNCH DAY MINUS ONE

Technicians at Launch Complex 39B successfully verified six electrical connections between the Orbiter and the Tethered Satellite System pallet. They closed the payload bay doors of Atlantis at 4:50 p.m. July 29; loaded liquid oxygen and liquid hydrogen reactants into Atlantis' fuel cell storage tanks by midnight last night and activated the Orbiter's communications system. Work in progress: the countdown for launch entered a planned built-in hold at 8 a.m. at the T-11 hour mark and the count picked up again at 7:36 p.m.; relieved a small pressure build-up from auxiliary power unit number 3 in the aft compartment; prepared to move the rotating service structure away from Atlantis between 6 and 7 p.m.; stowed critical items in the crew cabin; configured switches on the flight deck for launch; filled the sound suppression system water tank. Work scheduled: begin tanking operation at 1:36 a.m. July 31 looking toward a 9:56 a.m. launch tomorrow.

Associate NASA Administrator Jeremiah W. Pearson, III, said, 'If we get the satellite out and get the data, that's success. If we get the satellite back, we're heroes. The crew members continued their preparations for launch day. Commander of the crew is Loren J. Shriver and the pilot is Andrew M. Allen. Mission Specialists are Claude Nicollier from the European Space Agency, Marsha S. Ivins, Jeffrey A. Hoffman and Franklin R. Chang-Diaz. The Payload Specialist is Franco Malerba from the Italian Space Agency. Earlier today, the crew was briefed on the status of launch readiness and weather conditions; they also flew in T-38 trainers this morning. Forecasters put the chance of launch at 95%. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 30, 1992; Wilford, THE NEW YORK TIMES, p. A12, July 31, 1992.]

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ASBESTOS IN 90% OF KSC BUILDINGS

NASA's Inspector General's office has issued a report which says that asbestos, in one form or another, is found in 90% of the buildings at Kennedy Space Center. "It will not stop us from launching Shuttles," said Burt Summerfield, NASA Pollution Control and Sanitation Officer. "We have the people trained and appropriately equipped to deal with whatever repair or removals would be necessary to deal with asbestos problems as they arise." He said that, as far as he was aware, there were no worker complaints concerning asbestos-related health problems. ["Asbestos Problems Could Cripple KSC, Report Says," THE ORLANDO SENTINEL, p. 1A, July 31, 1992.]

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GOLDIN: SPACE STATION VOTE IN CONGRESS

Today, NASA Administrator Daniel S. Goldin issued a statement on Congress's action concerning the Space Station Program: "The American people won a great victory this week as the House of Representatives voted to continue building Space Station Freedom. As I listened to the debate in the House Chamber and watched the vote tally grow, I was proud that in these difficult economic times, Congress saw the wisdom in investing in our future. This successful vote would not have been possible without the dedication and hard work of many: NASA employees at the headquarters and centers, our contractor teammates, and many other concerned Americans who recognize the importance of extending human presence in space.

President Bush wrote a strong letter in support of Space Station Freedom, and Vice President Quayle made numerous phone calls to undecided congressmen. It was not just a victory for NASA, but for a nation that desperately needs the research and technology that will come from a permanent facility in space. Even the Space Station's opponents sent us a useful message. Many of them support the space program, but have become concerned over the years with overruns, slipped schedules, and mission failures. In building Space Station Freedom, we must make it the hallmark of the new NASA – a NASA that does things better, faster, and cheaper – without compromising safety. Freedom represents our toughest engineering and operational challenge to date. So we must make extra efforts to bring this project in on time and on budget. Only through a commitment to total quality and continuous improvement can we prove that the magic is back at NASA.

The American people have made a big investment in Space Station Freedom, and they expect a big return. They look to NASA for inspiration, hope, and opportunity. Now it's time to deliver like never before. With the experience and knowledge gained from the Space Station, we'll be ready to go back to the Moon and start exploring Mars. Lincoln said, "The struggle of today is not altogether for today – it [is] for a vast future also." I believe we will continue to be bold and keep reaching out. We will never give up the quest of exploration. That is our dream. That is our desire. And that is our destiny. Again, thanks to everyone who helped keep the dream alive. [Goldin, "Memorandum for All NASA and KSC and JPL Employees," July 30, 1992; "House Spares Space Station," FLORIDA TODAY, pp. 1A-2A, July 30, 1992; Holton, THE ORLANDO SENTINEL, pp. A-1 & A-6, July 30, 1992.]

July 31:

TEACHERS COMPLETE NASA WORKSHOP

Twelve junior high and high school teachers from Brevard County schools recently completed the two-week NASA-Brevard Links Academic Skills with Technology (NASA-

BLAST) workshop held at John F. Kennedy Space Center July 20-31. The teachers were selected for the workshop by the Brevard County School System. The NASA-BLAST program provides an in-depth opportunity for these instructors, who teach mathematics, science and technology to grades 7-12, to learn more about space science and technology. While at KSC, they work directly with agency engineers and scientists. NASA-BLAST is also designed to inform teachers about NASA's educational programs and materials.

The NASA-BLAST program participants were: Dr. Alexandra Penn, program coordinator, Cocoa High School; Rachel Capers and James Pugh, both of Titusville High School; Michael Deane, Southwest Junior High School, Palm Bay; William Hausman, Roosevelt School, Cocoa Beach; Sara Jones, Janice Robinson and Cheryl Warren, Merritt Island High School; Cora Knighton, John F. Kennedy Middle School, Rockledge; James LaCoy, Astronaut High School, Titusville; Celeste Rossi, Edgewood Junior High School, Merritt Island; and Deborah Ann Wilson, Andrew Jackson Middle School. Another integral part of the workshop is a session in which the teachers from the three disciplines work together to develop classroom programs that combine elements of their respective teaching fields. By using this approach, a technology instructor, for example, will be able to teach some math and science. This combination of curricula will help to provide a broader education for the students. On the first day of the workshop, the NASA-BLAST group was welcomed by KSC Deputy Director Gene Thomas, Jay F. Honeycutt, Director of Shuttle Management and Operations, explained how the Shuttle and its payloads are processed and launched at the Center. [NASA/KSC News Release No. 100-92, July 31, 1992.]

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STS 46: 40 SECONDS LAUNCH DELAY

Atlantis was launched this morning at 9:56:48.0684 a.m. EDT. Liftoff was delayed about 40 seconds as the countdown clock held briefly at the T minus 5 minute mark while the Orbiter's computers verified that the cockpit switches for the auxiliary power units were in the proper configuration to start the APUs. NASA Launch Director Brewster H. Shaw, Jr. said, "It was really a piece of cake countdown, so to speak." The small delay in launching kept Atlantis from being the first Space Shuttle since Challenger to have an on-time liftoff. Very little pad damage was reported from the launch. Both solid rocket boosters were to be towed to Hangar AF on Cape Canaveral Air Force Station on August 1. Landing of Atlantis is planned for Kennedy Space Center's Shuttle Landing Facility on August 7 at 8:09 a.m. EDT. [Banke, FLORIDA TODAY, p. 4A, July 31, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 3, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, Aug. 1, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-8, Aug. 1, 1992.]

AUGUST

August 1:

EG&G MANAGEMENT CHANGES

When NASA's Center Support Operations Directorate changed its management structure, EG&G Florida, Inc. (Base Operations Contractor) reacted. "We changed our management structure to conform with theirs," said company spokesperson **Beth Hall**. EG&G promoted an Associate General Manager, **John Pruden**, to be Deputy General Manager. Pruden was replaced by **James Parker**, formerly of Johnson Controls World Services Inc. (Titusville, FL). **Jerry Jorgensen** has moved from manager of technical operations to Associate General Manager of Propellants and Environmental Services. EG&G Florida Inc. is competing this year for the \$1.5 billion Base Operations Contract which Kennedy Space Center will award at the end of the year. Also competing are Johnson Controls; Lockheed Space Operations Co.; BAMS and Jacobson Engineering (Lakeland, FL). [Liden, FLORIDA TODAY, p. 12C, Aug. 1, 1992.]

I

PROCESSING CONTROL CENTER DEDICATED

Kennedy Space Center Director **Robert L. Crippen** today dedicated the new three-story Processing Control Center. The new \$11.3 million building houses offices, workshops and laboratories to maintain and test equipment needed to prepare and launch Shuttles. The 99,000-square-foot building is at Launch Complex 39, adjacent to the Vehicle Assembly Building. ["KSC Dedicates Shuttle Building," FLORIDA TODAY, p. 10E, Aug. 2, 1992.]

August 3:

ENDEAVOUR: HEAT SHIELDS INSTALLED

In Orbiter Processing Facility Bay 3, technicians have installed heat shields around the main engines of Endeavour as processing activities for the upcoming STS 47 mission continue. Work in progress: pressure decay check between the Spacelab and Orbiter; minor repairs of the radiators; installation of sleep stations; preparations to service the ammonia system. Rollover to the Vehicle Assembly Building is targeted for August 17; Endeavour will be mated to its external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., August 3, 1992.]

I

COLUMBIA: FUEL CELLS 2 & 3 REPLACED

Fuel cells number 2 and 3 have been replaced on the Space Shuttle Columbia during its stay for processing in OPF Bay 1. Work in progress: preparations to replace a thruster on the left orbital maneuvering system (OMS) pod; preparations to remove the three main engines; inspections of the radiators. [KSC SHUTTLE STATUS REPORT, 10 a.m., August 3, 1992.]

I

DISCOVERY: PROCESSING ACTIVITIES/OPF BAY 2

Technicians have installed and electrically mated the forward reaction control system in Discovery during processing in OPF Bay 2. The left orbital maneuvering system (OMS) pod has also been removed. The pod will be transferred to the Hypergolic Maintenance Facility so work may be performed on a faulty connector. Work in progress: preparations to close the payload bay doors; closeouts of the Orbiter; preparations to move to the VAB. Transfer of Discovery to the Vehicle Assembly Building High Bay 2 will occur August 6 for about 10 days to allow room for Atlantis' post-mission checkout. Discovery

will then move into OPF Bay 3 after Endeavour is transferred to the VAB later this month. [KSC SHUTTLE STATUS REPORT, 10 a.m., August 3, 1992.]

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MARS OBSERVER MATED TO TOS

The Mars Observer spacecraft was successfully mated today to its upper stage, the Transfer Orbit Stage (TOS), passing a major schedule milestone in processing. An Interface Verification Test (IVT) to verify the connections between the two flight elements is set for tomorrow (August 4). "As challenges in processing have come along, our teams have been willing to do what was necessary to have this milestone happen as close to schedule as possible," said Glenn Cunningham, Mars Observer Deputy Project Manager from the Jet Propulsion Laboratory. Later this week, the TOS will be fueled with its hydrazine attitude control propellant. Next week, closeout activities of the integrated payload stack will begin. The encapsulation into the Titan III nose fairing is scheduled for August 13, and the transfer from KSC's Payload Hazardous Servicing Facility to Launch Complex 40 for mating to the Titan III is targeted for August 17. All activities are currently on schedule for a liftoff of Mars Observer at the beginning of the planetary launch opportunity on September 16, 1992. The launch window extends from 1:02 p.m. to 2:34 p.m. EDT. The planetary launch opportunity ends on October 13. [NASA/KSC News Release No. 105-92, Aug. 3, 1992.]

August 5:

ATLANTIS TO LAND AT KSC

Atlantis has had its STS 46 landing at Kennedy Space Center rescheduled to occur on August 8 at 7:39 a.m. EDT at the Shuttle Landing Facility. Meanwhile, hydrolasing activities are continuing at Hangar AR to strip cork and foam away from the boosters. The mobile launcher platform was moved away from the launch pad to the parksite yesterday. [KSC SHUTTLE STATUS REPORT, 3:30 p.m., Aug. 5, 1992.]

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ENDEAVOUR EXPERIENCING WATER LEAK

Technicians in OPF Bay 3 continue to troubleshoot a minute water leak of Endeavour to the Spacelab water loops. Other work in progress for the upcoming STS 47 mission includes: pressure decay checks between the Orbiter and Spacelab; minor repairs of the vehicle's radiators; installation of sleep stations; preparations to service the ammonia system. Work scheduled: rollover to the Vehicle Assembly Building now targeted for August 17 for mating with the external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 3:30 p.m., Aug. 5, 1992.]

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COLUMBIA: LEFT OMS THRUSTER REPLACED

Workers in OPF Bay 1 are processing Columbia for its STS 52 mission; they have replaced a thruster on the left orbital maneuvering system pod. Work in progress: retest of the newly installed thruster on the left orbital maneuvering system pod; leak and functional tests of the auxiliary power units and inspections of the radiators. Discovery - in OPF Bay 2 - has undergone preparations to close its payload bay doors and to move the vehicle to the VAB. Technicians continue to work closing out the vehicle. Work scheduled: transfer to the VAB high bay 2 when the deorbit burn occurs for Atlantis to land in Florida at the SLF. This frees bay 2 for necessary post-flight deservicing operations on Atlantis. Discovery will remain in the VAB until Endeavour is transferred from bay 3 to the VAB later this month. [KSC SHUTTLE STATUS REPORT, 3:30 p.m., Aug. 5, 1992.]

August 7:

STS 46: CONCLUSION SET FOR KSC

Landing of the Space Shuttle Atlantis's STS 46 mission is scheduled for tomorrow at 7:39 a.m. EDT at Kennedy Space Center's Shuttle Landing Facility (SLF). Weather conditions for tomorrow's landing call for possible scattered clouds and a chance of having rain within 30 nautical miles of the SLF. KSC's landing convoy team will be on station at 5:30 a.m. tomorrow at the midpoint of the runway; Atlantis will be towed to OPF Bay 2 several hours after landing. There is a second landing opportunity at KSC August 8 at 9:12 a.m., on orbit 127. Two landing opportunities are also available at KSC on August 9, at 7:21 a.m. and at 8:55 a.m.

The STS 46 solid rocket boosters are inside Hangar AF; both aft skirts have been removed and disassembly operations are set to begin next week. The pieces will be shipped to the manufacturers for refurbishment. Once Atlantis is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. For this mission and all following missions, a new transport vehicle will be used to assist the crew, allowing them to egress the vehicle and doff their launch and re-entry suits easier and quicker. This vehicle, called the Crew Transport Vehicle, or CTV, was purchased from Continental Airlines at Denver for use at KSC. A similar CTV is used to assist crew egress at the conclusion of missions landing at Edwards Air Force Base, CA.

The CTV and other KSC landing convoy operations have been in an "on call" status since the launch of Atlantis on July 31. The primary functions of the Space Shuttle Recovery Convoy are to provide immediate service to the Orbiter after landing, prepare the Orbiter for towing to the Orbiter Processing Facility and assist crew egress. Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits and communications checks are made. A warming of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and safely as possible once the Orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant Umbilical Access Vehicles move into position at the rear of the Orbiter.

Following the purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the Orbiter's port side. Once access to the vehicle is gained, a physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle. About 3 hours after landing, the Orbiter will be towed to Orbiter Processing Facility Bay 2 for post-flight deservicing. Preparations will also begin to ready Atlantis for its ferry flight later this year to Palmdale, CA, where it will be taken out of service for about one year while it undergoes scheduled modifications and refurbishments.

Following departure from the SLF, the seven astronauts will be taken to their quarters in the O & C Building, meet with their families, undergo additional physical examinations and depart for the skid strip at Cape Canaveral Air Force Station for their flight back to JSC. The crew plans to depart for JSC roughly 5 to 6 hours after landing. The exact time of departure will be determined following touchdown. In the event a landing at KSC is not feasible and Atlantis landed at Edwards, an augmented KSC convoy team will be at the California site to safe the vehicle, disembark the crew and move the Orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter

aircraft on landing day. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 7, 1992; NASA/KSC News Release Number 107-92, Aug. 7, 1992.]

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ENDEAVOUR: PROCESSING ACTIVITIES CONTINUE

Endeavour is being readied for its September STS 47 mission in OPF Bay 3. Work in progress: servicing of the ammonia system; stowing of items in the Spacelab; continued troubleshooting of an air bubble in the Orbiter water lines connecting to the Spacelab module; cleaning of the payload bay; minor repairs of the radiators; installation of the sleep stations; closeouts of the vehicle. Work scheduled: interface verification system tests of the Spacelab; closure of the payload bay doors this weekend; structural leak checks of the Orbiter next week; rollover to the VAB targeted for August 17 for mating with the external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 7, 1992.]

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DISCOVERY/COLUMBIA PROCESSING ACTIVITIES

Discovery is scheduled for transfer from OPF Bay 2 to the VAB high bay 2 when Atlantis's deorbit burn begins; the Orbiter will remain in the VAB until Endeavour is transferred from OPF Bay 3 later this month. Work in progress: preparations to move to the Vehicle Assembly Building; closure of the crew cabin hatch; closeouts of the vehicle. Columbia remains in OPF Bay 1 for processing activities: tests of the Orbiter's fuel cells; tests of the hydraulic flight control systems; functional tests of the external tank doors; leak and functional tests of the auxiliary power units; inspections of the radiators. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 7, 1992.]

August 8:

ATLANTIS LANDS AT KSC

The STS 46 mission ended today where it began - at Kennedy Space Center. The seven member crew was greeted by astronaut Jim Howell who said, "Welcome to Florida and congratulations." Howell spoke to the crew from Mission Control in Houston, TX. Originally scheduled to land at KSC at 7:39 a.m.; the landing was delayed for one orbit due to threatening weather in Florida. The Orbiter's main gear touched down at 9:11:50 a.m. EDT at the space center's Shuttle Landing Facility, ending the 8-day journey. The total mission elapsed time to wheels stop was 7 days, 23 hours, 16 minutes and 10 seconds. The total distance Atlantis traveled was 3,321,007 miles. During this flight, which was extended one day, Atlantis made 127 orbits of the Earth. Atlantis was towed to OPF Bay 2 by 3 p.m. this afternoon for post-flight deservicing and inspections. Initial inspections indicate the vehicle fared well during the flight. An average number of tile dings were reported and the new tires were in very good condition. Continued inspections of the vehicle are planned this week including the tiles and main engines. Technicians are preparing to open the payload bay doors tomorrow and remove the Tethered Satellite System and EURECA hardware on August 12. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 10, 1992; Banke and Halvorson, FLORIDA TODAY, pp. 1A-2A, Aug. 9, 1992; Date, THE ORLANDO SENTINEL, p. A-3, Aug. 9, 1992; Banke, FLORIDA TODAY, p. 1A, Aug. 8, 1992.]

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LOCKHEED: CUTS MINIMIZED DUE TO ATTRITION

Lockheed Space Operation Co. (Titusville, FL), through its spokesman J. B. Klump, minimized the impact of the expected cut of 266 employees by saying that all but 12 would leave through normal attrition, retirement or acceptance of early retirement. Klump

said, "We were not totally successful in our efforts (to minimize layoffs) because we did have to give letters to 12 people. But that's a whole lot better than it might have been." The layoffs were due to Congress's slashing of the proposed NASA budget. [Halvorson, FLORIDA TODAY, p. 10E, Aug. 9, 1992.]

August 9:

STS 47: LOADED WITH FIRSTS

Endeavour's STS 47 mission will result in several milestones for the Space Shuttle Program. It will be the 50th mission. Mark C. Lee and N. Jan Davis will be the first married astronauts to fly on the same mission together. Mae C. Jemison, an MD, will be the first black woman astronaut to fly on an Orbiter. The first Japanese astronaut to fly aboard a Shuttle will be Mamoru Mohri; he will be involved in experiments aboard the Spacelab. Finally, Endeavour's second mission of its young flight career will mark the return to active status of Robert L. "Hoot" Gibson. The other two members of the crew will be Curtis L. Brown, Jr. and Jay Apt. [Banke, FLORIDA TODAY, p. 2A, Aug. 9, 1992.]

August 10:

ENDEAVOUR: STS 47 PROCESSING ACTIVITIES

Interface verification system tests of the Japan-Spacelab and Endeavour have been completed. Closeouts of the Orbiter water cooling lines for the Spacelab have also been completed. Work in progress looking to a September launch of STS 47: final inspections of the payload bay; closing the payload bay doors; installation of sleep stations; closeouts of the vehicle. Work scheduled: structural leak checks of the Orbiter this week; weight and center of gravity determinations; rollover to the Vehicle Assembly Building is targeted for August 17 for mating with the external tank and the solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 10, 1992.]

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COLUMBIA: FUEL CELLS TESTED

Tests of the Space Shuttle Columbia's fuel cells have been completed in OPF Bay 1. Work in progress: removing the main engines and transferring them to the VAB engine shop; preparations to install the remote manipulator system; tests of the hydraulic flight control system; functional tests of the external tank doors; leak and functional tests of the auxiliary power units; inspections of the radiators; replacement of a water spray boiler; reconfiguration of the payload bay. Discovery, undergoing processing activities in OPF Bay 2, will be transferred to VAB high bay 2 to make room for Atlantis which returned from space yesterday. Discovery will remain in the VAB until Endeavour is transferred from OPF Bay 3 to the VAB later this month. Technicians, meanwhile, are gaining access to the wings to perform structural modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 10, 1992.]

August 11:

STS 47 PROCESSING ACTIVITIES

Technicians in OPF Bay 3 are stowing Endeavour's Ku-band antenna. Other work in progress includes: final inspections of the payload bay; closing the payload bay doors; installation of sleep stations; closeouts of the vehicle; preparations to install the doors on the aft compartment. Work scheduled: structural leak checks of the Orbiter this week; weight and center of gravity determinations; rollover to the Vehicle Assembly Building targeted for August 17 for mating with the external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 11, 1992.]

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STS 46: POST-FLIGHT WORK ON ATLANTIS

With the return of Atlantis to the Kennedy Space Center on August 8, technicians in Orbiter Processing Facility Bay 2 have begun opening the payload bay doors; installing protective covers over payload items and preparing to remove the chin panel for inspections. Work scheduled: removal of the IMAX camera August 12 and the Tethered Satellite and EURECA hardware tomorrow also. [Brown, FLORIDA TODAY, Aug. 10, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 11, 1992; Halvorson, FLORIDA TODAY, Aug. 11, 1992.]

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COLUMBIA/DISCOVERY PROCESSING

Technicians in OPF Bay 1 have removed Columbia's main engines and transferred them to the VAB engine shop and pressurized the main landing gear struts. Work in progress: installation of the wheels and tires; preparations to install the remote manipulator system; functional tests of the external tank doors; leak and functional tests of the auxiliary power units; inspections of the radiators; replacement of a water spray boiler and reconfiguring the payload bay. Discovery continues to undergo processing activities while in OPF Bay: gaining access to the wings to perform structural modifications and jacking and leveling the Orbiter. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 11, 1992.]

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MAHONEY NAMED TO TSS INVESTIGATION

William G. Mahoney, KSC Payload Operations, has been named along with six others to a committee formed to investigate the problems that occurred during the first mission of the Tethered Satellite System (TSS) during STS 46. Darrell Branscome, Chief Engineer at Langley Research Center, will chair the committee. The board was appointed by Jeremiah W. Pearson, III, Associate Administrator, Office of Space Flight, NASA Headquarters. "The board is authorized to take all necessary action to review the anomalies associated with the TSS problems to determine the possible cause and recommend corrective measures to prevent reoccurrence," according to Pearson. An initial report of the review findings, supporting data and analysis are to be submitted to Pearson by August 28, 1992.

All relevant flight hardware and data that team members will need to examine are being maintained in the "as flown" condition. Tethered Satellite System hardware removed from Atlantis following its landing is being kept in a secure location at Kennedy Space Center. Data obtained during the mission, as well as pertinent data gathered during development and testing phases of the Tethered Satellite Program, is being preserved with no alteration. The Board of Investigation is supported by the TSS Systems Working Group based at the Marshall Space Flight Center (Huntsville, AL), and by other MSFC elements the board may require. (NASA/KSC News Release No. 92-129, Aug. 11, 1992; Banke, FLORIDA TODAY, p. 6A, Aug. 14, 1992.)

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DELTA FLIGHT DELAYED AT CCAFS

A faulty command receiver aboard a Delta 2 rocket at Cape Canaveral Air Force Station resulted in the delay of the rocket's Satcom C-4 mission. The unit was removed and sent to its manufacturer, GE Astro Space (Princeton, NJ) for repairs, according to GE spokeswoman Laura

Eberle. "A new launch date has not been decided on as yet, but we're looking somewhere during the week of August 24," she said. ["Satellite Ready for Delta Launch," FLORIDA TODAY, p. 10E, Aug. 9, 1992; Banke, FLORIDA TODAY, p. 5A, Aug. 12, 1992.]

August 12:

ENDEAVOUR: PAYLOAD BAY DOORS CLOSED

The Space Shuttle Endeavour, currently in OPF Bay 3, now has closed payload bay doors. Work in progress: structural leak checks of the vehicle; fitting the external tank door thermal barriers; installation of sleep stations; closeouts of the vehicle; preparations to install the doors on the aft compartment. Weight and gravity determinations must be done before rollover to the Vehicle Assembly Building on August 17. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 12, 1992.]

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COLUMBIA: TESTS UNDERWAY

Columbia is undergoing processing activities in preparation for its STS 52 LAGEOS mission. Work in progress on Columbia in OPF Bay 1 includes: installing a getaway special beam in the payload bay; functional tests of the orbital maneuvering system pod; installing main landing gear wheels and tires; functional tests of the external tank doors; leak and functional tests of the auxiliary power units; inspections of the radiators and replacement of a water spray boiler. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 12, 1992.]

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DISCOVERY AND ATLANTIS OPERATIONS

Technicians are gaining access to Discovery's wings to perform structural modifications and plan to transfer the Space Shuttle to OPF Bay 3 after Endeavour is rolled to the VAB next week. Atlantis is undergoing post-flight operations in OPF Bay w. Workers are removing the Tethered Satellite and EURECA payload hardware beginning at 1 p.m. today; preparing to remove the chin panel for inspections and conducting post-flight inspections. The IMAX camera is scheduled for removal from Atlantis. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 12, 1992.]

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TITAN 4 SENT TO PAD TO REPLACE CORRODED ROCKET

A classified national security satellite will be launched before the end of the year aboard a Titan 4 rocket which has just been rolled to the launch pad. Another Titan had been on the pad for over a year, but rust damage caused officials to worry that the rocket would explode in flight. [Halvorson, FLORIDA TODAY, p. 6A, Aug. 13, 1992.]

August 14:

SNYDER RECEIVES JAPANESE FLAGS

A quartet of Japanese students visited the Kennedy Space Center today and presented KSC with a set of streamer-like flags shaped like carp fish. The gifts were received by Glenn Snyder, STS 47 Payload Processing Manager; Endeavour will carry a joint American/Japanese payload. Two of Japan's highly prized ornamental fish will fly aboard the STS 47 mission as experiments inside the Spacelab-Japan (SL-J) module, which will remain in Endeavour's payload bay during the week-long Shuttle flight. Japanese scientists developed the life science experiment to study the effects of weightlessness may have on the behavioral and neurophysiological functions of the fish. The student group consists of two boys and two girls and ranges from 10 to 15 years of age. The four were chosen from a field of 613 students who submitted entries to an essay contest

sponsored by the Nagoya Broadcasting Network of Japan. The contest was also endorsed by the Japanese Board of Education, the National Space Development Agency of Japan (NASDA) and the Japan International Space Year Association. In commemoration of the upcoming Shuttle mission, "The Dream Toward Space" was chosen as the theme of the contest. Presentation of the flags occurred at Spaceport USA's Rocket Garden August 14 at 10 a.m. [NASA/KSC News Release No. 108-92, Aug. 10, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 10, 1992.]

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ENDEAVOUR: VEHICLE CLOSEOUTS UNDERWAY

Workers in OPF Bay 3 are closing out Endeavour in preparation for its STS 47 mission. Other work in progress: a final cycle of the payload bay doors; installation of a seal for the airlock hatch; structural leak checks of the wings and preparations for installing the doors on the aft compartment. Weight and gravity determinations were set to be conducted on August 16; rollover to the Vehicle Assembly Building remained set for August 17. In the VAB, Endeavour will be mated with its external tank and solid rocket boosters, pending resolution of the crane incident in the VAB. [Banke, FLORIDA TODAY, Aug. 13, 1992; KSC SHUTTLE STATUS REPORT, 11:30 a.m., Aug. 14, 1992; Banke, FLORIDA TODAY, Aug. 16, 1992; "Crane Problem May Delay Start of Endeavour's Trip," THE ORLANDO SENTINEL, Aug. 18, 1992.]

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COLUMBIA/DISCOVERY PREPPING FOR MISSIONS

In OPF Bay 1, technicians are testing Columbia's brake system. They are also conducting leak and functional tests of the main propulsion system liquid oxygen system; functional tests of the orbital maneuvering system pod; reconfiguration of the aft flight deck and tile operations. Discovery, which remains in VAB Bay 2, continues to undergo structural modifications inside its wings. The vehicle will be transferred to OPF Bay 2 once Endeavour has been rolled to the VAB next week. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., Aug. 14, 1992; "Orbiter Update," FLORIDA TODAY, p. 10E, Aug. 16, 1992.]

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ATLANTIS: MODIFICATION PERIOD

Atlantis is currently in OPF Bay 2 following its recent landing at Kennedy Space Center at the conclusion of its STS 46 mission. In the OPF, technicians have offloaded residual hypergolic propellant. Work in progress: post-flight inspections; removing the vehicle's tires; tests of the hydraulic system; preparations to remove the forward reaction control system; post-flight inspections of the main engines. Scheduled: removal of the Tethered Satellite, EURECA and EOIM payload hardware. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., Aug. 14, 1992; "Orbiter Update," FLORIDA TODAY, p. 10E, Aug. 16, 1992.]

August 16:

ENDEAVOUR/HUBBLE RESCUE MISSION

Hubble Telescope scientists have gotten their wish; NASA has agreed to schedule an Endeavour flight for the rescue of the HST which has a flawed mirror. "We were hoping for Endeavour, and we're very pleased," said Ed Weiler, Hubble's Chief Scientist. Repairing the HST will take three spacewalks, but Hubble managers wanted an Orbiter with the capability of four EVAs. Weiler said, "It gives us a whole 'nother day of contingency on top of our three days. If we learned anything from Intelsat, it is try to have as much contingency time to think as you can." [Banke, FLORIDA TODAY, pp. 9E & 10E, Aug. 16, 1992.]

August 17:

CRANE ACCIDENT TO BE INVESTIGATED

Center Director Robert L. Crippen has appointed an investigation board to examine an incident involving a 250-ton crane that apparently experienced erratic movement while lifting a solid rocket booster segment in High Bay 1 of the Vehicle Assembly Building (VAB). ON August 11, crane operators were preparing to stack the left forward segment for the STS 52 mission using the crane's slow speed operating mode. There was a sudden increase in the lateral speed of the crane during the operation. The operator stopped the crane immediately and there was no damage to personnel, flight hardware or ground equipment. Russell Lloyd (Chief, Facilities Division, Space Shuttle Office) said, "We were never in a close enough position of creating a catastrophe." Columbia is scheduled to fly the STS 52 mission, targeted for launch in October, with the Laser Geodynamic Satellite-2 (LAGEOS II) payload.

A team is troubleshooting the crane and will make necessary repairs prior to using it again. Booster stacking operations and all crane operations have been suspended pending the resolution of the issue. The 30-foot-long, 12-foot-diameter, left forward booster segment has been transferred to a storage facility while the investigation is continuing. Jackie E. Smith (Director, Safety and Reliability) has been named to chair the board. Assisting Smith on the investigation are board members: David Kelley (Chief, Structural Systems Branch, Ground Engineering); Howard Meeks (Systems Engineering Section, Payload Operations Directorate; Ronald Eatman (Project Engineering Staff, Facilities Engineering Directorate); James Myers (Systems Assurance Office, Mission Assurance Directorate); Arthur Clark (Cables and Special Power Section, Facilities Engineering Directorate; Todd Steinrock (Mechanical Section, Facilities Directorate). Malcolm Glenn will serve as the safety advisor, John Biedenham will provide legal assistance and Lisa Malone is the public affairs representative. Broad functions include investigating the facts surrounding the mishap, determining the probable cause, assessing the possibility of a recurrence or similar mishap, and recommending corrective action. A final report is due during the second week of October. [Banke, FLORIDA TODAY, p. 6A, Aug. 12, 1992; Banke, FLORIDA TODAY, p. 6A, Aug. 13, 1992; NASA/KSC News Release No. 109-92, Aug. 17, 1992; Banke, FLORIDA TODAY, p. 6A, Aug. 14, 1992; Banke, FLORIDA TODAY, p. 2A, Aug. 16, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, Aug. 17, 1992.]

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SPACE PROJECT MAY MOVE TO BREVARD

A Goddard Space Flight Center project may be moved from Maryland to Brevard County soon. "There would be a big advantage in not having to move people up and down the East Coast all the time," said Donald Williams, manager of the ozone-monitoring experiment which is carried on the Shuttle once a year. The project's managers hope to lease a building on U. S. 1 owned by Technological Research and Development Authority. TRDA Executive Director Frank Kinney said, "I'm hoping for a partnership, not just a landlord-tenant relationship." Other possible ventures include: a technology transfer agreement with Goddard for commercial applications of space technology and cooperative work agreements and research opportunities for Florida university students. The decision on the possible move is to be made public in September. [Brown, FLORIDA TODAY, p. 1A, Aug. 18, 1992.]

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WEATHER MAY DELAY ATLAS LAUNCH

An Atlas rocket is nearly ready for launch from Cape Canaveral Air Force Station this week, but stormy Florida weather may keep the rocket on the ground. "Thunderstorms in the area are the main concern," said Terri Bracher, spokeswoman of the 45th Space Wing, headquartered at Patrick Air Force Base, FL. General Dynamics spokeswoman Julie Andrews said, "Everything is going just fine and the vehicle looks good. We're just watching the weather." The Atlas will carry the Galaxy 1-R payload, a Hughes Aircraft Co. communications satellite. Launch is set for August 20 and windows extend from 6:39 to 7:54 p.m., 8:26 to 8:39 p.m. and 9:10 to 10:20 p.m. [Banke, FLORIDA TODAY, p. 6A, Aug. 18, 1992.]

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ENDEAVOUR AWAITS RESOLUTION OF CRANE PROBLEM

Endeavour was moved to the Vehicle Assembly Building early August 17, but KSC managers continue to debate the safety of the VAB's giant lifting cranes. "We still don't know exactly why the crane behaved the way it did," said Lisa Malone, KSC spokeswoman. All suspect parts are being tested in a KSC laboratory and have been replaced with spares. Test results will effect Endeavour's launch date which is currently targeted for September 11; the liftoff will be delayed if Endeavour cannot be lifted for mating with its external tank and solid rocket boosters in the next several days. Discovery was moved on the 17th from the VAB to OPF Bay 3 just vacated by Endeavour and continues to undergo modifications and maintenance like that of Columbia last year. [Banke, FLORIDA TODAY, p. 6A, Aug. 18, 1992; "Orbiter Update," FLORIDA TODAY, p. 10E, Aug. 16, 1992.]

August 18:

CRANE USE APPROVED

Endeavour will be lifted into place for mating with its external tank tomorrow because Kennedy Space Center management has approved the use of a suspect crane. KSC spokeswoman Lisa Malone said that tests show the crane to be functional but that additional caution will be used. Another crane, the one which proved faulty last week, will continue to undergo tests and analysis. Endeavour should be connected to its ET by 8 p.m. tomorrow and rolled to LC 39B early Tuesday morning, about three days later than planned. [Banke, FLORIDA TODAY, p. 6A, Aug. 19, 1992.]

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UPPER STAGE PROBLEM FOR MO

The Mars Observer probe is having a problem with its upper stage. Last weekend, when a worker tried to apply a material to the upper stage a spark passed between his tool and the upper stage motor, according to Laura Ayers, spokeswoman for Orbital Sciences Corp. Officials say they are working around the clock to determine the source of the stray voltage and fix it. Pending the problem's resolution, the Mars Observer (MO) will be installed in its Titan nose cone and moved out to LC 40 from which the rocket will be launched. [Banke, FLORIDA TODAY, p. 6A, Aug. 19, 1992.]

August 19:

REPAIR SPARES DELAY IN MO LAUNCH

"We are on schedule for launch," said Dave Evans, Project Manager for the Mars Observer Mission. An electrical problem with the spacecraft's transfer orbit stage has been fixed. Tests determined that stray voltage came from a radio system which allows the motor to communicate with ground; suspect parts were replaced. Launch is again on track for

September 16. Wesley Huntress, Director of Solar System Exploration for NASA, said, "After 17 long years, America is going back to Mars." [Banke, FLORIDA TODAY, p. 1A, Aug. 20, 1992.]

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COSMONAUTS TOUR SPACE CENTER

Two cosmonauts and their families toured the Kennedy Space Center today. The cosmonauts, Anatoly Artsebarsky and Sergei Krikalev, expressed an interest in flying aboard the Space Shuttle. The pair toured Launch Complex 39B this afternoon. Krikalev was aboard the space station Mir when the Soviet Union collapsed. ["Soviet Astronauts," FLORIDA TODAY, p. 6A, Aug. 19, 1992.]

August 21:

ENDEAVOUR HARDMATED TO ET

In the Vehicle Assembly Building High Bay 3, Endeavour was hardmated to its external tank this morning at 5:30 EDT. Work in progress for STS 47: making electrical connections between the vehicle elements; connecting the T zero umbilicals to the vehicle. Work scheduled: Shuttle Interface Test to verify connections between the elements and the launch platform set to begin tomorrow night; rollout to Launch Complex 39B is targeted for midnight August 24; the Terminal Countdown Demonstration Test (TCDT) is set for August 27 & 28. Launch is planned for the second week of September. [KSC SHUTTLE STATUS REPORT, 8 a.m., Aug. 21, 1992.]

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COLUMBIA: PARTS REPLACED

During processing activities in OPF Bay 1, Columbia has had its No. 1 APU and No. fuel cell replaced. Technicians have installed the vehicle's drag chute and conducted leak and functional tests of the water spray boiler. Work in progress: installation of the main engines; functional tests of the orbital maneuvering system pod; tile operations; testing of connections for the STS 52 payload. Discovery, now in OPF Bay 3, is undergoing power up tests; hydraulic system operations; structural modifications of its wings and preparations for powering up the vehicle. An OMS pod is scheduled for installation this weekend. [KSC SHUTTLE STATUS REPORT, 8 a.m., Aug. 21, 1992.]

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ATLANTIS: MODIFICATION PERIOD BEGINS

Atlantis, just returned from its STS 46 mission, has now entered a modification period at Kennedy Space Center prior to being ferried to Palmdale, CA, for lengthy modifications at Rockwell International's plant. Work in progress: removing components in preparation for the ferry flight and preparations to offload the auxiliary power unit catch bottles and to drain residuals from the Orbiter. Work scheduled: draining the auxiliary power unit catch bottles. During this activity both OPF Bays 1 and 2 will be locked out this weekend. [KSC SHUTTLE STATUS REPORT, 8 a.m., Aug. 21, 1992; "Bye-Bye Birdie: KSC Team Prepares for Atlantis Send-Off," FLORIDA TODAY, pp. 10E & 9E, Aug. 23, 1992.]

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RAIN GROUNDS ATLAS

General Dynamics Corp. scrubbed its second attempt to launch its Atlas rocket due to rainy weather in the launch area. The Atlas will carry a Hughes Aircraft communications satellite to a geosynchronous orbit. A previous attempt to launch was also scrubbed because of weather. [Halvorson, FLORIDA TODAY, Aug. 22, 1992.]

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MARS OBSERVER MOVED TO LC 40

The Mars Observer spacecraft passed another milestone toward launch when it was moved from the Payload Hazardous Servicing Facility on Kennedy Space Center to Launch Complex 40 on Cape Canaveral Air Force Station and mated to the Martin Marietta Titan III rocket. With the payload atop the launch vehicle, checks of the Mars Observer spacecraft and the attached Transfer Orbit Stage (TOS) will begin this weekend. Two major exercises to prepare for launch are planned next week: an Operational Readiness Test and a Countdown Demonstration Test. The ORT - scheduled for August 26 - will test all facilities that send and receive data during flight activities. These facilities include NASA, JPL, and Air Force tracking and data systems around the world. The countdown dress rehearsal - on August 28 - will simulate launch day activities and all countdown events as closely as possible. The mobile service tower will be retracted from around the launch vehicle, and the full NASA, Martin Marietta and Orbital Sciences launch team will participate in this exercise. All activities are currently on schedule to support a launch at the opening of the Mars planetary opportunity on September 16, with the window extending from 1:02 to 3:05 p.m. EDT. [NASA/KSC News Release No. 111-92, Aug. 21, 1992.]

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ENDEAVOUR'S ROLLOUT

Endeavour is scheduled to rollout to Launch Complex 39B beginning at 12:01 a.m. EDT, August 25. Moving at top speed of 1 mph, the crawler transporter will transfer the STS 47 vehicle elements 4.1 miles in about seven hours. On August 17, NASA's newest Space Shuttle was towed to the Vehicle Assembly Building after its 11-week processing period in the Orbiter Processing Facility. In the VAB, Endeavour was mated to its external tank and solid rocket boosters today and tests of critical connections between the vehicle elements and the launch platform were scheduled for this weekend. Flight crew members for Mission STS 47 are scheduled to arrive next Wednesday for the TCDT. The practice countdown will begin at 8 a.m., August 27, at the T-24 hour mark leading up to the simulated T minus zero mark at 11 a.m. on August 28.

Commanding the STS 47 mission is Robert L. "Hoot" Gibson and Curtis L. Brown, Jr. is the Pilot. The four mission specialists are Mark C. Lee, N. Jan Davis, Jay Apt and Mae C. Jemison. Mamoru Mohri from the Japanese Space Agency, NASDA, is the payload specialist. While at Kennedy Space Center, the crew will receive training in emergency escape procedures at the launch pad, practice driving the M113 tracked vehicles and practice flying in the Shuttle Training Aircraft. In addition, the four mission specialists and Payload Specialist Mohri will visit Hangar L on Cape Canaveral Air Force Station to meet with several Spacelab J principal investigators. Spacelab J is the primary mission of STS 47; it was installed in Endeavour on July 14. Flight crew members conducted a thorough walkdown of the habitable module shortly after its installation. Endeavour's end-of-mission landing is planned at Kennedy Space Center's Shuttle Landing Facility. KSC's landing and recovery teams will be on hand to prepare the vehicle for the tow back to the OPF. STS 47 will be Endeavour's second space mission. It will be a planned seven-day around-the-clock science gathering mission and it set for the second week of September. [NASA/KSC News Release No. 112-92, Aug. 21, 1992.]

August 22:

SPACEPORT FLORIDA LAUNCH SET FOR TODAY

Spaceport Florida hopes that today's launch of a suborbital weather probe today will give the state agency a boost as well. "We certainly would have been better off launching this

a year ago," said Edward Ellegood, Spaceport spokesman. ["Spaceport Hopes Launch Today Will Lift Sagging Program," FLORIDA TODAY, p. 8B & 7B, Aug. 22, 1992; Brown, FLORIDA TODAY, p. 7A, Aug. 22, 1992.]

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KSC/CCAFS PREPARE FOR ANDREW

Workers at Kennedy Space Center and Cape Canaveral Air Force Station worked today to prepare for a possible onslaught by Hurricane Andrew. The rockets and satellites at risk are valued at nearly \$1 billion. Endeavour's launch date may be pushed back to September 12. KSC spokeswoman Lisa Malone said, "We're working with a tight schedule now, and if we had to stay in the VAB we would probably have to re-evaluate the launch date." Air Force Sgt. J. P. Butler said, "We are preparing for sustained winds of up to 50 mph within the next 72 hours." KSC spokesman George Diller said, "Right now our inclination is to ride out the storm." He said the Mars Observer could be pulled off the Titan 3 rocket if necessary and taken to a nearby shelter; such a move would likely delay the launch. [Halvorson, FLORIDA TODAY, p. 4A, Aug. 23, 1992.]

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ROBOTS TO CLEAN AT KSC

"We're looking at more structured and controlled methods of doing processing - including cleaning the facilities," said Gabor Tamasi of KSC's Robotics Automation Development Laboratory. The robots are not designed to replace human janitors, but are built to work on overnight cleaning stints. "The robot can do the job around the clock," said Tamasi, who saw such a robot at a trade show last year. "It looked like a large square object, about 30 inches long, 20 inches high and 24 inches wide. It had scrubbers in the front and a squeegee behind the scrubbers. It dispensed cleaning solution, then had a vacuum to suction it up. It cleaned really well." The robot will be tested in buildings which are not critical to processing operations and contract proposals will be accepted at Kennedy Space Center until August 27. [Brown, FLORIDA TODAY, p. 10E, Aug. 23, 1992.]

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ENDEAVOUR TESTS SCHEDULED FOR TODAY

In the Vehicle Assembly Building workers are preparing a key test to verify electrical connections between the vehicle elements and the crawler and whether the elements are properly attached to each other. If the work is completed on schedule, rollout will occur August 25. [Brown, FLORIDA TODAY, p. 7A, Aug. 22, 1992.]

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ATLAS DESTROYED AFTER LAUNCH

An Atlas rocket launched today was destroyed about eight minutes into its flight because it had careened out of control when its upper stage failed to ignite. An investigative board was immediately formed by General Dynamics, manufacturer of the Atlas. Stormy weather had delayed the launch Dynamics which came on its third attempt. The rocket carried a Hughes Aircraft Co. communications satellite. Lightning forced the first scrub of the launch on Aug. 20. Today's launch windows were from 6:40 to 7:55 p.m.; 8:27 to 8:39 p.m. and 9:11 to 10:20 p.m. Today's attempt was the fifth commercial launch by General Dynamics which has commitments for 25 commercial launches throughout the decade. [Brown, FLORIDA TODAY, p. 1A, Aug. 20, 1992; "Atlas Rocket, Satellite Explode Over Atlantic," FLORIDA TODAY, Aug. 23, 1992; Halvorson, FLORIDA TODAY, p. 1A, Aug. 23, 1992; Halvorson, FLORIDA TODAY, p. 7A, Aug. 22, 1992; Halvorson, FLORIDA TODAY, p. 2A, Aug. 23, 1992.]

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SPACEPORT FLORIDA LAUNCHES FIRST ROCKET

Spaceport Florida launched a ten-foot Microstar rocket from a pad at Cape San Blas at 10 a.m. this morning. The first rocket ever launched by a state agency had been delayed 30 minutes by clouds in the area. "I'm not the type that jumps up and down, but inside I certainly was," said Ed O'Connor, Executive Director of the Spaceport Florida Authority. The Microstar's mission was to gather "basic weather data over the launch site about 20 miles west of Apalachicola, FL. Ozone-measuring launches are expected to take place starting in the fall, according to Kevin Kloesel, assistant professor of meteorology at Florida State University. ["1st State Rocket Soars," FLORIDA TODAY, pp. 14B & 13B, Aug. 23, 1992; Yeomans, THE ORLANDO SENTINEL, Aug. 23, 1992.]

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FIVE SILVER SNOOPYS AWARDED

Silver Snoopy Awards were recently awarded to three Lockheed employees and two NASA employees. Astronaut James H. Newman presented the Snoopy to Lockheed's Christina Pechon, James Eshleman and David Baumann. NASA employee Andrew Haugevik received his Snoopy from astronaut Thomas D. Akers and Ellen Dozier, also a NASA employee, received her Snoopy from astronaut Mark C. Lee. Recipients are given a Silver Snoopy pin which has been flown on a previous Shuttle mission plus a framed certificate and a congratulatory letter signed by the presenting astronaut. ["Five Get Astronauts' Silver Snoopy Awards," FLORIDA TODAY, p. 9E, Aug. 23, 1992.]

August 23:

ENDEAVOUR: ROLLOUT MAY BE DELAYED

Hurricane Andrew may delay the rollout of Endeavour to Launch Complex 39B tomorrow morning; the trek was originally scheduled to begin at 4:00 a.m. August 24. If winds are greater than 46 miles per hour, rollout will not occur. Bus tours from Spaceport USA were suspended while hurricane preparations were underway. KSC spokesman Mitch Varnes said, "We didn't want the extra traffic when we're moving stuff around." Extra sandbags have been placed around doorways to prevent water from seeping in; loose equipment has been moved into the VAB and OPFs. The Mars Observer spacecraft will wait out the storm at its launch pad, LC 40. [Brown, FLORIDA TODAY, p. 6A, Aug. 24, 1992.]

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ATLAS INVESTIGATION MOVES TO CALIFORNIA

Hurricane Andrew's imminent arrival has forced General Dynamics to move its investigation of Saturday's Atlas rocket failure to California. "We had planned to leave Florida on Monday, but the hotel really is encouraging us to leave now," said company spokeswoman Julie Andrews. When one of the Atlas's second stage engines failed to start after liftoff August 22, the rocket was destroyed by range safety officers. The payload had been a Hughes Aircraft Co. communications satellite. ["Atlas Prove Moves to California," FLORIDA TODAY, p. 2A, Aug. 24, 1992; Date, THE ORLANDO SENTINEL, Sept. 23, 1992.]

August 24:

I-NET WINS KSC CONTRACT

NASA's John F. Kennedy Space Center has selected I-Net, Inc. (Bethesda, MD) for negotiation of a contract to provide engineering support services to the center's Engineering Development Directorate. It is the largest contract KSC has given to a minority-owned firm and is the largest contract ever won by the company. David Wells, Vice President and Corporate Counsel, said, "We're delighted minority companies are

getting this interest from the government." I-Net, Inc. replaces Boeing, Inc. The contract will run for five years starting October 1, 1992, and is valued at more than \$100 million. I-Net will provide a broad base of engineering services which may range in scope from technical manpower in support of a variety of government laboratories to engineering and management of complex applied research and technology projects. This includes engineering studies and investigations; conceptual, preliminary, detail and development engineering; and documentation support and maintenance. The contract was competed nationally as a small, disadvantaged business set-aside. [NASA/KSC News Release No. C92-12, Aug. 24, 1992; Liden, FLORIDA TODAY, p. 18C, Aug. 25, 1992.]

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ENDEAVOUR: ELECTRICAL CONNECTIONS MADE

In the Vehicle Assembly Building, the Shuttle Interface Test has verified the connections between the vehicle elements and the launch platform; all electrical connections have been completed. Work in progress: preparations to roll the vehicle out to Launch Complex 39B and pre-rollout inspections. Work scheduled: retraction of the VAB platforms later tonight; rollout to LC 39B set for 4:00 a.m. tomorrow; TCDT targeted for August 27-28; launch set for the second week in September. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 24, 1992.]

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COLUMBIA: 1 & 3 ENGINES INSTALLED

In OPF Bay 1, Columbia has had its No. 1 and 3 engines installed in addition to the installation of a power reactant storage and distribution system tank. Work in progress: installation of the No. 2 main engine; preparations to install the remote manipulating system (also called the "robot arm"); tile operations and testing of connections for the STS 52 payload. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 24, 1992.]

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DISCOVERY/ATLANTIS PROCESSING

Discovery's left orbital maneuvering system pod was installed this weekend. Work in progress in OPF Bay 3: connections of the left OMS pod; integrated testing of the main propulsion system; tests of the Microwave Scanning Beam Landing System. The auxiliary power unit catch bottles of Atlantis have been drained while the Orbiter remains in OPF Bay 2. Work in progress prior to the ferry flight to Palmdale, CA: removing components and the auxiliary power unit number 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 24, 1992.]

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ENDEAVOUR ROLLS OUT TO LC 39B

First motion of the Space Shuttle Endeavour came at 3:25 a.m. as workers rolled the Orbiter out to Launch Complex 39B and was hard down at the pad at 10:15 a.m. Rollout was delayed a bit by the space center's efforts to batten down in advance of the arrival of Hurricane Andrew. The KSC Launch Readiness Review is underway today. Work scheduled: making connections between the launch pad facilities and the vehicle elements; STS 47 flight crew arrival is expected at 11:30 a.m. tomorrow; the Terminal Countdown Demonstration Test begins at 8 a.m. August 27 and ends with the simulated T zero at 11 a.m. Friday, August 28. Launch remains targeted for the second week of September. [Brown, FLORIDA TODAY, p. 2A, Aug. 25, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 25, 1992; Grinter, Press Site Librarian.]

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COLUMBIA: NO. 2 ENGINE INSTALLED

Workers in Orbiter Processing Facility Bay 2 have completed the installation of Columbia's number 2 main engine in preparation for the STS 52 mission. Work in progress: tests of the fuel cells; functional tests of the orbital maneuvering system pods; hookups of the three main engines; preparations to install the remote manipulator system; tile operations; testing of the connections for the STS 52 payload. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 25, 1992.]

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MODIFICATIONS: DISCOVERY & ATLANTIS

While Discovery remains in OPF Bay 3, a number of processing activities are taking place: preparations to service freon coolant loop no. 2; tests of the left orbital maneuvering system pod; integrated testing of the main propulsion system. Atlantis, meanwhile, is in OPF Bay 2 and is undergoing final processing activities before being ferried to Palmdale, CA: modifications to the communications system; drying of the main engines; removing components; removal of another auxiliary power unit; preparations to remove the robot arm (RMS); flushing of the waste management system. Auxiliary power unit no. 2 has been removed. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 25, 1992.]

August 25:

LAUNCH READINESS REVIEW STATEMENT

Following the conclusion of today's STS 47 Launch Readiness Review, Space Shuttle Launch Director Robert B. Sieck determined that the Shuttle Endeavour and Spacelab-J payload are on target for a launch on September 12. "We've mapped out an ambitious but makeable schedule for the STS 47 launch, while still allowing the team time off for the Labor Day holiday," Sieck said. "We're going to continue readying Endeavour and look forward to meeting with other managers next week at the Flight Readiness Review to set a firm launch date." [STS-47 LAUNCH READINESS REVIEW STATEMENT, Aug. 25, 1992.]

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FOLEY MATERIAL WINS STATION CONTRACT

Foley Material Handling Co., Inc. (Ashland, VA) has been awarded a \$678,710 contract to fabricate, assemble and install overhead cranes in the Space Station Processing Facility (SSPF) and the Payload Spin Test Facility Replacement (PSTF-R) at Kennedy Space Center. The contract was awarded August 11, and the company will have until August 1993 to complete the final assembly and test of four cranes in the SSPF. This equipment includes one crane with a lifting capacity of 15 tons in the facility's airlock, two 5-ton cranes in the intermediate bay and one 5-ton crane in the hardware assembly and inspection area. The installation must be completed by this date so that the SSPF can be ready for operation in August 1994. Installation of a 20-ton crane in the high bay of PSTF-R (also known as the Hazardous Processing Facility) must be completed by November 1993. Kennedy Space Center will be responsible for the prelaunch processing of all Space Station Freedom flight hardware, as well as its launch into orbit aboard Space Shuttle Orbiters. The SSPF will serve as the primary KSC facility for the inspection, assembly and final checkout of space station components. [NASA/KSC News Release No. 113-92, Aug. 25, 1992.]

August 26:

ENDEAVOUR POWERED UP AT PAD

The Space Shuttle Endeavour was hard down on the pad at Launch Complex 39B at 10:15 a.m. yesterday and was powered up last night. At 1300 hours Tuesday, the rotating service structure was moved into position around the vehicle. The seven members of the STS 47 flight crew arrived early at KSC last night - at 9:20 p.m. - to avoid adverse weather conditions from Hurricane Andrew. Technicians at the pad are making connections between the launch pad facilities and the vehicle elements. Work scheduled: terminal countdown demonstration test begins at 8 a.m. Thursday (August 27) and ends with the simulated T-zero at 11 a.m. Friday (August 28); main engine flight readiness test and helium signature leak tests this weekend. Launch remains targeted for the second week in September. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 26, 1992; Banke, FLORIDA TODAY, Aug. 27, 1992.]

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COLUMBIA & DISCOVERY: PROCESSING ACTIVITIES

In Orbiter Processing Facility Bay 1, technicians are preparing to install a robot arm (RMS) in Columbia's cargo bay as part of its STS 52 preparations. Other activities include: installation of the CANEX payload; preparations for the Crew Equipment Interface Test (CEIT); configuring the crew cabin for flight; installing window number 8. The nose landing gear tires have been installed on Discovery which is being processed in OPF Bay 3; the brakes have also been installed. Work in progress: installing the main landing gear tires; preparations to service freon coolant loop number 2; tests of the left orbital maneuvering system pod; integrated testing of the main propulsion system; preparations for the CEIT test this weekend. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 26, 1992.]

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ATLANTIS: MODIFICATION PERIOD IN OPF BAY 2

The three auxiliary power units of Atlantis have been removed while the Orbiter is still in OPF Bay 2 prior to its ferry flight to California. Preparations have also been made to connect the left forward assembly/nose cone. Work in progress: post-flight measurements of the 17-inch disconnect umbilicals; deservicing of the auxiliary power unit water; modifications to the communications system and preparations to remove the remote manipulator system (also known as the robot arm). [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 26, 1992.]

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ANDREW SHUTS DOWN MS/LA CENTERS

As the Space Shuttle Endeavour was rolling to the pad yesterday, NASA centers in Mississippi and Louisiana were shutting down in anticipation of the arrival of Hurricane Andrew. Stennis Space Center (Bay St. Louis, MS) and Michoud Assembly Facility (New Orleans, LA) sent home almost 8,000 workers as the centers were closed to all but essential personnel, according to NASA's spokesman Don Amatore. Both sites were said to be well able to withstand the winds of Andrew. [Banke, FLORIDA TODAY, p. 1B, Aug. 26, 1992.]

August 27:

ENDEAVOUR: VEHICLE/PAD CONNECTIONS MADE

Endeavour is now on the pad at LC 39B and technicians have completed connections between the vehicle and the pad in preparation for the Orbiter's STS 47 mission the second week in September. Work in progress: terminal countdown demonstration test

began at 0800 today; circulating the hydraulic fluid; preparations to load the hypergolic propellants into the Orbiter's onboard storage tanks. STS 47 flight crew activities: Commander Robert L. "Hoot" Gibson and Pilot Curtis L. Brown, Jr. practiced flying in the Shuttle Training Aircraft this morning while the rest of the crew visited principal investigators for Spacelab J at Hangar L. This morning, KSC Shuttle and payload team members will update the crew on the status of the vehicle and payloads. Later today, the crew will receive routine emergency escape training procedures at the launch pad. Work scheduled: terminal countdown demonstration test concludes with the simulated T zero at 11 a.m. tomorrow (August 28); main engine flight readiness test and helium signature leak tests this weekend; flight readiness review set for September 1; launch targeted for September 12. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 27, 1992; Banke, FLORIDA TODAY, p. 2A, Aug. 28, 1992.]

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COLUMBIA: CANEX PAYLOAD INSTALLED

In Orbiter Processing Bay 1 technicians have installed the CANEX payload in the cargo bay of Columbia as part of the STS 52 processing activities. Other work in progress: preparations to install the robot arm (RMS); preparations for the crew equipment interface test (CEIT); configuring the crew cabin for flight; installing window number 8. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 27, 1992.]

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DISCOVERY/ATLANTIS PROCESSING/MODIFICATIONS

Discovery is in OPF Bay 3 where it is undergoing the following activities: installation of heat shields around the main engines; outfitting the crew module for flight; preparations to service freon coolant loop number 2; tests of the left orbital maneuvering system pod; integrated testing of the main propulsion system; preparation for the CEIT test this weekend. Post-flight measurements of the 17-inch disconnect umbilicals of Atlantis have been completed in OPF Bay 2 where the Orbiter is awaiting its ferry flight to Palmdale, CA, for further modifications. Other processing activities: preparations to remove the forward reaction control system (FRCS) and the three main engines; deservicing of the auxiliary power unit water; modifications to the communications system; preparations to remove the robot arm (RMS). [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 27, 1992.]

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MARS OBSERVER TO BE RESCHEDULED

The launch of Mars Observer aboard a Titan III rocket from Launch Complex 40 at Cape Canaveral is being postponed. During an inspection of the payload contained within the Titan nose fairing atop the rocket, particulate contamination was observed on the surface of the Mars Observer spacecraft. A precautionary decision has been made to remove the payload from the Titan and return it to a spacecraft facility on KSC for cleaning. The contamination may have been introduced into the fairing when a dry nitrogen purge was placed on the spacecraft as part of securing for Hurricane Andrew. KSC spokesman George Diller said that photographs would be taken to document the satellite's condition. "We would expect by early Monday [August 31] morning we should be able to start doing inspections," he said. Diller said that it was too early to be talking about a new launch date. The countdown dress rehearsal scheduled for August 28 will not be held at this time. A new launch date cannot be determined until it is known how long it will take to clean the spacecraft. However, a launch before the end of September is expected. The planetary launch window extends through October 13. [NASA/KSC News Release No. 116-92, Aug. 27, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, Aug. 28, 1992; Banke,

FLORIDA TODAY, p. 2A, Aug. 30, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Aug. 28, 1992.]

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NINTH LAUNCH MOVED TO JANUARY

Endeavour's communications satellite mission originally scheduled for December of this year has been moved to the target date of January 13 of next year. A mid-December launch would have been extra expensive due to overtime and holidays. Changing the launch date, said Jay Honeycutt, "probably takes a little stress out of our lives." Honeycutt is Director of Shuttle Operations at KSC. Endeavour's next flight was to have been late April 1993. Making the change, "doesn't really impact anything after [January]," said Honeycutt. [Date, THE ORLANDO SENTINEL, Aug. 28, 1992.]

August 28:

KSC JOINS HURRICANE RELIEF EFFORT

A convoy of 12 trucks and cars packed with durable goods left Kennedy Space Center this morning en route to South Florida to assist residents hit hardest by Hurricane Andrew. The hurricane swept through areas of Miami earlier this week with relentless devastation, leaving more than 250,000 people homeless. Because of the great outcry for assistance, NASA and its KSC contractors began mobilizing to do whatever possible to assist those left hungry, hurting and homeless. Three 5,000-gallon water tankers led the convoy on the five-hour drive followed by two 40-foot tractor trailers loaded with an assortment of relief items for the people of South Florida. Included on the trucks are: meal packets, sleeping cots, blankets, mattresses, tents, tables, shelves, chairs, generators, plywood, rope, wire fencing, tool boxes, a three-ton hoist and a variety of clothes and shoes.

"It's all excess material over and above what we are required to keep here at the center for our own hurricane plan," said NASA's Mike Stevens of the Fire and Rescue Office. The convoy will establish the initial drop center for future relief efforts. Cal Staubus, NASA's Fire and Rescue Office Chief, said, "at this time we are piggybacking our operation with that of the Titusville Chapter of the Salvation Army. They already have a network established to dispatch the supplies." The group, made up of about 16 NASA and contractor employees, will dispatch the wares from a designated staging area to locations the Salvation Army says is in most need. Everything will be given away. Staubus said two of the water tankers have already been allocated to area hospitals. "The tanker drivers accept the possibility that their stay may be longer than expected," Staubus said. "They may be asked to continue to refill them for quite a while. We're not sure when the tankers themselves will be returned."

Forklift operator, Ralph Brown, EG&G Florida, Inc., said he was given an armful of toys from friends when they learned he was driving one of the convoy trucks. "It's a chance to help somebody," he said. "I even went down to Winn Dixie last night myself and bought a bunch of baby food so I could hand it out. It feels good to be able to help." Scores of other KSC employees also assisted in the effort to ready the water tankers and trucks. Included are those who loaded the supplies on the trucks and those who tested the water in the tankers to ensure its purity. Already, KSC has been organizing drop points at all major KSC facilities for the collection of additional supplies to be taken to Hurricane Andrew victims. "We will help as long as the need is present," Staubus said. [NASA/KSC News Release No. 117-92, Aug. 28, 1992.]

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ENDEAVOUR FACES MAIN ENGINE TEST

Endeavour will undergo a main engine test today to confirm the operability of engine valves. Tests continue to be conducted as the launch date approaches. "We've got a full schedule between now and launch," said KSC spokeswoman Lisa Malone. Labor Day will provide a single day of rest for pad technicians readying Endeavour for its STS 47 mission. [Banke, FLORIDA TODAY, p. 4A, Aug. 29, 1992.]

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GOLDIN: HELP SMALL BUSINESS

NASA Administrator Daniel S. Goldin has announced that he will upgrade the position of Small and Disadvantaged Business Director to Assistant Administrator, equal to directors of program and administrative offices. Goldin called the decision "a strong signal" in a series of moves to insure that the nation's small firms, including those owned by members of minorities and women, win a larger share of NASA contracts. He made the announcement at a small business conference in Nashua, N. H. "In the past," Goldin said, "we have focused much of our attention on working with the giant aerospace companies with the big hardware contracts and comparatively little on working with small business. We must change our orientation," he declared, stating that NASA has begun the process through a series of procurement initiatives. One of the most important changes, Goldin said, is an action to reduce drastically the amount of paperwork and other administrative tasks now required to win smaller contracts. "We are looking at 10-page requests for proposals and contracts versus 90-to-100 page documents," Goldin said.

The biggest change to help small businesses could come in mid-range procurements between \$25,000 and \$500,000, Goldin said. Although they represent only 15 percent of NASA's contract dollar, they account for more than 80 percent of the procurement actions. Other steps Goldin has directed the agency to take to bolster awards to small firms include:

- *Requiring prime contractors to increase the percentage of subcontracts with small and disadvantaged businesses (SDBs).

- *Establishing a firm percentage for SDB awards in competitive procurements instead of a mere goal.

- *Making subcontracting to small firms an important evaluation factor in source selection.

- *Rewarding primes that exceed their subcontracting goals.

- *Establishing a "Minority Business Resource Advisory Committee" within NASA to help SDBs deal with the agency.

- *Pursuing statutory authority to allow the agency to make SDB set-asides.

"NASA must take down the obstacles that discourage so many small businesses from engaging in government contracting," Goldin said. "We must make our requirements and our contracting process more accessible. We cannot bury you in forms, certifications, contract clauses and reporting requirements." Goldin stated that NASA made direct awards to small firms of \$870 million in fiscal year 1991, while another \$1.4 million flowed to small firms through subcontracting. "We are convinced we can do more," he declared.

NASA's Kennedy Space Center (KSC), FL, currently is evaluating proposals for a \$2.7 billion base operations contract and has declared that 30 percent of this must be subcontracted to small, disadvantaged or women-owned businesses. Recently, KSC selected a minority-owned firm for a \$75 million contract with options up to \$150 million. "The contract is not for routine support services," Goldin noted. "It is for applied research and technology, including tasks involving telerobotics and development of a highly sensitive spectrometer to detect hazardous gas." [NASA/KSC News Release No. 92-137, Aug. 28, 1992.]

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TETHERED SATELLITE INVESTIGATION

The Tethered Satellite System (TSS) Investigative Board today presented an interim status report to Space Flight Associate Administrator Jeremiah W. Pearson, III. Board Chairman Darrell Branscome reported the team is focusing on 5 problems that occurred during deployment of the Tethered Satellite System on Space Shuttle mission STS 46. Those problems are:

- *Failure of the No. 2 umbilical to retract from the tethered satellite. Failure of the satellite to deploy on the first "flyaway" attempt.
- *The unplanned stop of the satellite at 179 meters.
- *The unplanned stop of the satellite at 256 meters.
- *Inability to either deploy or retrieve the satellite at 224 meters.

The tethered satellite has been removed from the Orbiter Atlantis and placed in a checkout stand in the Operations and Control Facility at KSC. The Board had its first look at TSS hardware this week. Detailed inspection of the tether reel assembly provided evidence that the unplanned stops at 179 and 256 meters were due to a mechanical obstruction. Visual evidence and preliminary analysis point to a 1/4-inch diameter bolt which prevented part of the reel mechanism from freely traveling back and forth. The level wind mechanism, which operates similarly to the way a fishing reel feeds out line, contacted the end of the bolt preventing it from moving all the way out to its stopping point. The bolt is part of a structural modification that was installed on the reel assembly earlier this year. The modification was required following the final computer analysis which is done for every Shuttle mission to verify that all structural connections between the payload and Orbiter will withstand the rigors of launch and landing. KSC spokesman George Diller said, "There was some surprise to open the reel and find what caused part of the problem in such an obvious way. But this does not fully resolve the issue. There are still some things we do not understand. In fact, officials believe the bolt may have caused only two of the five observed problems.

Engineers require that attach points such as these be at least twice as strong as necessary to pass stringent safety criteria. Analysis indicated the margin of safety was less than that for some fasteners at the point where the reel assembly was mounted to its specially adapted support structure. The modification strengthened the mounting area to provide the required factor of safety. Testing of the flight hardware is planned to verify that this mechanical obstruction was the cause of the jamming of the deployment reel and the subsequent unplanned stops of the satellite at 179 and 256 meters. The Board believes that even without the problems with the umbilical and the jamming of the tether at the upper tether control mechanism, this problem would have prevented full deployment of the tethered satellite. Branscome said the board is continuing work to identify causes for the other anomalies: the umbilical problem; the first "flyaway" attempt; and the jamming at 224 meters. The next interim report is expected to be complete in

about a month. [Tether Investigation Status Report 1, Aug. 28, 1992; Banke, FLORIDA TODAY, p. 4A, Aug. 29, 1992.]

August 29:

FORECAST GOOD FOR DELTA LIFTOFF

Capt. Mark Secrist of the 45th Weather Squadron at Patrick Air Force Base said today that the weather was expected to be good for Monday's [September 1] launch of a Delta 2 rocket carrying a communications satellite built by G. E. Aero Space. Launch is scheduled for between 6:41 and 7:34 a.m. or 8:38 and 9:18 a.m. The launch will be the 12th commercial liftoff for McDonnell Douglas Space Systems Co. and the 34th consecutive success for the Delta program since a 1986 failure. The satellite is a SATCOM 4 and will be used to provide cable programming to more than 10,000 cable systems in all 50 states. [Banke, FLORIDA TODAY, p. 2A, Aug. 30, 1992.]

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COLUMBIA: LAGEOS MISSION IN OCTOBER

The Space Shuttle Columbia will launch the Laser Geodynamic Satellite in October. The STS 52 mission will study the Earth's continents and such features as California's San Andreas Fault. LAGEOS will work in tandem with a similar golf-ball sized satellite launched in 1976 on a Delta. The two satellites will be tracked by 26 ground stations which will fire lasers at the satellites and calculate the time it takes for the light to return to the ground stations. LAGEOS will be boosted to its ultimate orbit by an Italian-built upper stage motor. [Brown, FLORIDA TODAY, Aug. 30, 1992.]

August 30:

ENDEAVOUR READYING FOR LAUNCH

"Everything's looking good," said KSC spokesman Bruce Buckingham about pre-launch preparations for Endeavour's STS 47 mission set for the second week of September. The Shuttle's propulsion system has been checked for leaks and have begun to prepare for hypergolic propellant loading onto the Orbiter's onboard fuel storage tanks. Meanwhile, weather forecasts continue to look favorable for September 1's launch of a Delta 2 with its communications satellite payload. Meteorologists predict a 90 percent chance of favorable weather for launch. ["Endeavour's Preparations Rolling Along," FLORIDA TODAY, p. 4A, Aug. 31, 1992; "Delta Set For Launch Monday," FLORIDA TODAY, p. 10E, Aug. 30, 1992.]

August 31:

STS 47: ENDEAVOUR TESTING ON PAD

At Launch Complex 39B, Endeavour has had its inertial measurement unit calibrations completed. A main engine flight readiness test, helium signature test and the terminal countdown demonstration test have also been completed. The pad is being cleared for the loading of hypergolic fuels on board the Orbiter and the pad will remain closed through midnight September 1. Hypergolic fuel pressurization and the STS 47 flight readiness review have been scheduled. [KSC SHUTTLE STATUS REPORT, 12:30 p.m., Aug. 31, 1992; Halvorson, FLORIDA TODAY, Sept. 1, 1992.]

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STS 52: COLUMBIA/LAGEOS MISSION

The remote manipulator system (robot arm) has been installed in the cargo bay of Columbia in preparation for its upcoming STS 52 LAGEOS mission. Payload pre-mate operations and the crew equipment interface test have also been completed. Forward reaction control system installation is underway and Columbia has been scheduled for

orbital maneuvering system functional tests. In the Vehicle Assembly Building, lift and mating of the external tank to the solid rocket boosters is scheduled to occur no earlier than September 1. [KSC SHUTTLE STATUS REPORT, 12:30 p.m., Aug. 31, 1992; Brown, FLORIDA TODAY, p. 10E, Aug. 30, 1992.]

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CEIT COMPLETED FOR DISCOVERY

In Orbiter Processing Facility Bay 3, technicians have completed Discovery's crew equipment interface test. Work in progress: raising the main landing gear for tile work; crew module leak checks; deservicing freon coolant loop #1. [KSC SHUTTLE STATUS REPORT, 12:30 p.m., Aug. 31, 1992.]

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ATLANTIS: MODIFICATION PERIOD CONTINUES

In OPF Bay 2, technicians have removed the forward reaction control system from Atlantis. Work in progress: the FRCS has been moved from OPF Bay 2 to the Hypergolic Maintenance Facility; main propulsion system leak checks; preparations for removing the power reactant and storage distribution system tanks. Work scheduled: removal of Atlantis' three main engines and removal of the power reactant and storage distribution system tank sets number 3 and 4. [KSC SHUTTLE STATUS REPORT, 12:30 p.m., Aug. 31, 1992.]

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CABLE TV SATELLITE ORBITED

A new cable television satellite was launched into orbit today aboard a McDonnell Douglas Delta 2 launch vehicle. Liftoff came from Cape Canaveral Air Force Station's Launch Complex 17 at 6:41 a.m. Because the rocket's exhaust billowed into an unusual shape, several radio stations mistakenly reported that it had exploded. "I told them that they forgot to take gravity and the curvature of the Earth into account," said Tom Williams, a McDonnell Douglas Space Systems Co. spokesman. [Halvorsen, FLORIDA TODAY, p. 2A, Sept. 1, 1992.]

SEPTEMBER

September 1:

STS 47: TCDT COMPLETED

At Launch Complex 39B, technicians and the crew of Endeavour's STS 47 mission have completed their terminal countdown demonstration test. Inertial Measurement Unit calibrations are complete and the main engine flight readiness test and the helium signature test have also been completed. Work in progress: LC 39B has been cleared for the loading of hypergolic fuels on board the Orbiter; flight readiness review; launch countdown preparations. Work scheduled: hypergolic fuel pressurization; Orbiter aft closeouts; further troubleshooting of the 2-inch gaseous oxygen line quick disconnect valve near the main propulsion system's 17-inch liquid oxygen umbilical. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 1, 1992.]

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COLUMBIA: APUS INSTALLED

Columbia has now been outfitted with its APUs in preparation for its upcoming STS 52 LAGEOS mission. Other completed tasks include: the installation of fuel cells storage tank set number 5; crew equipment interface test; payload pre-mate operations; payload bay door cycles. Work in progress: forward reaction control system electrical mates and checks; Orbiter-payload interface verification tests; ammonia boiler servicing. Work scheduled: orbital maneuvering system functional tests; auxiliary power unit hook-ups; external tank mate with solid rocket boosters (on hold pending determination of VAB 250-ton crane status). [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 1, 1992.]

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DISCOVERY: STS 53 PREPARATIONS CONTINUE

In Orbiter Processing Facility Bay 3, technicians have completed crew module leak checks on Discovery and have finished the crew equipment interface test as well. The Orbiter's main landing gear have been raised for tile work. Work in progress: deservicing freon coolant loop #1 and hydraulic line fill and bleed operations. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 1, 1992.]

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ATLANTIS: MODIFICATIONS CONTINUE

The forward reaction control system of Atlantis has been moved to the Hypergolic Maintenance Facility during the pre-ferry flight phase of modification of the Orbiter. Work in progress: main propulsion system leak checks; preparations for removing the power reactant and storage distribution system tank sets numbers 3 and 4; deservicing of the payload bay active cooling system and removal of the robot arm (RMS) from the vehicle's payload bay. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 1, 1992.]

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STS 47: SEPTEMBER 12 IS LAUNCH DAY

NASA has targeted the launch of the Space Shuttle Endeavour on a joint U.S./Japanese mission [STS 47] on September 12, pending resolution of a technical problem with a connection in an oxygen line in the Orbiter's main propulsion system. If the problem is not resolved by the end of the week, NASA managers will reassess the launch date. Endeavour's 7-member crew will liftoff from Launch Complex 39B at Kennedy Space Center during a window that extends from 10:23 a.m. to 2:17 p.m. EDT. The 6-day, 20-hour and 37 minute mission will end with a landing on September 19 at the Kennedy Space Center.

STS 47 - also identified by its payload, Spacelab J - will be the 50th launch of the Space Shuttle Program and the second for Endeavour. Aboard the orbiting laboratory will be 43 experiments provided by Japan and the U. S. Astronaut Robert L. "Hoot" Gibson, making his fourth flight, will be the mission commander. The pilot is Curtis L. Brown, Jr. Missions Specialists are Mark C. Lee, Jay Apt, N. Jan Davis and Mae C. Jemison. Japan's Mamoru Mohri will be the payload specialist.

Spacelab J's primary objective is to use the space environment to address important scientific and technical questions in materials science, life science and technology. The joint mission will emphasize international cooperation of governments, industry and academia in an evolving partnership to explore and develop the potential of the space environment. The mission also will add to the growing base of experience in preparation for the start of Space Station operations later this decade. [Launch Advisory: NASA to Launch Joint US/Japanese Flight September 12, Sept. 1, 1992; Halvorson, FLORIDA TODAY, p. 1A, Sept. 1, 1992.]

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KSC HURRICANE RELIEF EFFORT CONTINUES

Employees of Kennedy Space Center are uniting in their efforts to assist Hurricane Andrew victims in South Florida by donating food, supplies and cash. KSC is encouraging its 20,000-plus employees to bring in additional supplies to various drop points around the center so they can be properly packaged for delivery to those areas hit hardest by the storm. Items employees are being asked to bring include all types of baby products and food, meal-type canned foods, an assortment of camping gear, large family-size tents, flashlights, batteries, can openers, trash bags and personal hygiene items. Lou Phillips, a packaging specialist for NASA, is assisting in the effort to properly package the items brought in for South Florida residents. "We will be spending the next day making food packs for small, medium and large families so they can be handed out easily," Phillips said. "We will also be sending a lot of excess building materials that we have on hand here at KSC."

Materials from KSC employees will be gathered through tomorrow in time for a convoy of at least three 40-foot long flat-bed trucks to leave KSC Thursday morning. Contributions coming in after Wednesday will be transported to South Florida later. Cash donations are also being accepted through a special fund established with the Salvation Army in Titusville. The effort to collect needed items will continue throughout the next several weeks. Last week a convoy of nearly a dozen trucks and cars packed with durable goods left Kennedy Space Center en route to South Florida to assist residents hit hardest by Hurricane Andrew. NASA and its KSC contractors began mobilizing soon after the storm passed to do whatever possible to assist the nearly 250,000 people left homeless and hungry in Andrew's wake.

Friday morning, August 28, three 5,000-gallon water tankers led the convoy on the five-hour drive, followed by two 40-foot tractor trailers loaded with an assortment of relief items for the people of South Florida. Included on the trucks were: meal packets, sleeping cots, blankets, mattresses, tents, tables, shelves, chairs, generators, plywood, rope, wire fencing, tool boxes and a three-ton hoist. The water tankers will remain in the Homestead, FL, area for an indefinite period of time. Everything sent down last week was excess material over and above what is required to be kept at KSC for the center's own hurricane plan.

"The group, made up of about 16 NASA and contractor employees, dispatched the wares from a darkened Homestead Pizza Hut parking lot late Friday night," said Cal Staubus, NASA's Fire and Rescue Office Chief and convoy commander. "Everything was given away." On August 26, six EG&G Florida Fire Services personnel headed down to Miami to assist local emergency personnel with rescue efforts. They took with them a rescue/extraction vehicle from KSC. While there, the crews assisted with search and rescue, emergency response, and hospital field work efforts. This team was among the first outside fire/rescue personnel to respond to the need. They are providing around-the-clock assistance on a continual basis. [NASA/KSC News Release No. 119-92, Sept. 1, 1992; Banke, FLORIDA TODAY, p. 5A, Sept. 3, 1992.]

September 2:

STS 47: FRR COMPLETED

Shuttle managers at Kennedy Space Center have completed the Flight Readiness Review for STS 47; the managers have picked September 12 as launch day contingent on further troubleshooting the 2-inch gaseous oxygen line quick disconnect valve near the main propulsion system's 17-inch liquid oxygen umbilical. Technicians have also finished loading hypergolic fuels onboard the Orbiter. Work in progress: open pad for normal operations following hypergolic loading operations and launch countdown preparations. Work scheduled: auxiliary power unit leak checks; Orbiter aft closeouts. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 2, 1992.]

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COLUMBIA: STS 52 MISSION PREPARATIONS

Technicians have installed auxiliary power units and fuel cells storage tank set number 5 in the Space Shuttle Columbia which is being processed in OPF Bay 1 for its upcoming STS 52 mission. The Orbiter's payload bay doors have been cycled. Work in progress: forward reaction control system electrical mates and checks; Orbiter-payload interface verification tests; ammonia boiler servicing; orbital maneuvering system electrical redundancy checks; remote manipulator system (RMS) verification checks. Work scheduled: auxiliary power unit hook-ups; external tank mate with solid rocket boosters (on hold pending resolution of VAB 250-ton crane status. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 2, 1992.]

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STS 53/DOD: DISCOVERY PROCESSING

Discovery's crew equipment verification test and crew module leak checks have been completed in OPF Bay 3. Work in progress: deservicing freon coolant loop #1; hydraulic line fill and bleed operations; main propulsion system leak checks; auxiliary power unit leak checks; cabin vent valve replacement. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 2, 1992.]

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ATLANTIS: MODIFICATIONS PERIOD CONTINUES

In OPF Bay 2, the RMS has been removed from the cargo bay of Atlantis prior to its ferry flight to California for extensive modification work. Work in progress at KSC: main propulsion system leak checks; deservice payload bay active cooling system; removal of power reactant and storage distribution system tanks sets numbers 3 and 4; removal of the Orbiter's three main engines. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 2, 1992.]

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MARS OBSERVER LAUNCH RESCHEDULED

NASA today rescheduled the launch of Mars Observer aboard a Titan III rocket from Launch Complex 40 for Friday, September 25. The launch window extends from 12:27 to 2:27 p.m. EDT. The payload cleaning has been completed and re-encapsulation will begin tonight. The payload will be transported from Kennedy Space Center to Complex 40 on Cape Canaveral Air Force Station late on Thursday night, September 3, and mated to the Titan III rocket early on Friday morning, September 4. A countdown dress rehearsal is scheduled for September 17. Because there is no contingency in this schedule, the launch date will be reviewed after the countdown test. Additional precautions have been taken at the launch pad and with the spacecraft to assure that recontamination is unlikely to occur. [NASA/KSC News Release No. 120-92, Sept. 2, 1992.]

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ENDEAVOUR LAUNCH: 'TOTALLY MAKABLE'

NASA officials continue to believe that a leaking oxygen line aboard Endeavour can be repaired sufficiently soon so that the Orbiter will launch on time on September 12. "It's totally makable," said KSC spokesman Mitch Varnes. The leak is from a seal where the gaseous oxygen lines from the Orbiter and the external tank connect to each other. Officials have said that the leak occurs only when exposed to pressures greater than those normally used during launch. The problem was detected during a special high-pressure check earlier in the week. [Banke, FLORIDA TODAY, p. 3A, Sept. 3, 1992.]

September 3:

ENDEAVOUR: EVA SUIT ADDED

At Launch Complex 39B, Endeavour is being readied for its STS 47 flight scheduled for September 12. Work completed: loading of hypergolic fuels on board the Orbiter; auxiliary power unit leak checks; installation of contingency Extravehicular Mobility Unit into the Orbiter. Work in progress: launch countdown preparations; continued troubleshooting of the 2-inch gaseous oxygen line quick disconnect valve near the main propulsion system's 17-inch liquid oxygen umbilical; Orbiter aft closeouts; EVA suit functional checkout. Work scheduled: leak checks on reassembled 2-inch gaseous oxygen line quick disconnect September 4; ordnance operations September 5; countdown scheduled to pick up at T-43 hour mark at 3:00 a.m., September 9.; the STS 47 crew is scheduled to arrive at KSC on the morning of September 9. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 3, 1992.]

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STS 52: LAGEOS FLIGHT PREPARATIONS

Remote manipulator system (RMS) verification checks have been completed on Columbia which is undergoing STS 52 mission processing in OPF Bay 1. Other work completed: auxiliary power unit hook-ups; ammonia boiler servicing; installation of fuel cells storage tank set number 5. Work in progress: forward reaction control system checks; Orbiter-payload interface verification tests; orbital maneuvering system electrical redundancy checks. Work scheduled: external tank mate with solid rocket boosters (on hold pending resolution of VAB 250-ton crane status.) [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 3, 1992.]

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DISCOVERY: OPF BAY 3 PROCESSING

APU number 3 has been installed in Discovery which is undergoing processing in OPF Bay 3. A cabin vent valve has been replaced and hydraulic line fill and bleed operations are complete to date. Work in progress: installation of drag chute; deservicing of freon coolant loop #1; main propulsion system leak checks; APU leak checks. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 3, 1992.]

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ATLANTIS: PRE-FERRY FLIGHT MODIFICATIONS

The three main engines of Atlantis have been removed while the Orbiter undergoes preliminary modifications in OPF Bay 2. The RMS has also been removed from the vehicle's cargo bay. Work in progress: deservice of the payload bay active cooling system and removal of the power reactant and storage distribution system tanks sets numbers 3 and 4. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 3, 1992.]

September 4:

STS 47: EVA UNITS INSTALLED

Contingency extravehicular mobility units have been installed in Endeavour and a functional checkout of the spacesuits has been completed. The Space Shuttle Endeavour remains poised for launch September 12 on its STS 47 mission at Launch Complex 39B. Work in progress: launch countdown preparations; troubleshooting continued on the 2-inch gaseous oxygen line quick disconnect valve near the main propulsion system's 17-inch liquid oxygen umbilical. Reassembly of the line is in progress and leak checks of the system are planned for tonight. Orbiter aft closeouts; installation of crew escape pole; ordnance range safety checks. Work scheduled: ordnance operations (September 5); purge of the external tank (September 8); countdown scheduled to pick up at the T-43 hour mark at 3:00 a.m., September 9. The STS 47 crew is scheduled to arrive at Kennedy Space Center on the morning of September 9. [Banke, FLORIDA TODAY, p. 2A, Sept. 4, 1992; KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 4, 1992.]

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COLUMBIA: STS 52 PROCESSING

In OPF Bay 1, technicians have completed servicing Columbia's ammonia boiler and the installation of fuel cells storage tank set number 5. Work in progress for STS 52: forward reaction control system checks; orbital maneuvering system electrical redundancy checks; remote manipulator system (robot arm) checkouts; main engine electrical checks and heat shield installation and retest of auxiliary power unit number 1. Work scheduled: Orbiter-payload interface verification tests; external tank mate with solid rocket boosters (on hold for no earlier than the morning of September 9 pending resolution of the VAB's 250-ton crane status.) [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 4, 1992.]

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DISCOVERY & ATLANTIS: PROCESSING

Discovery remains in OPF Bay 3 where it is being processed for its STS 53 mission for the Department of Defense. Work in progress: deservicing freon coolant loop #1; main propulsion system leak checks; auxiliary power unit leak checks; nose wheel steering checks; payload interface verification tests; drag chute electrical connections. Atlantis is being prepared in OPF Bay 2 for its ferry flight to Palmdale, CA, where it will undergo extensive modification at the Rockwell International plant in Palmdale. Work completed: the removal of the power reactant and storage distribution system tanks sets numbers

3 and 4; removal of the Orbiter's three main engines; removal of the robot arm from the payload bay. Work in progress: deservicing of the payload bay active cooling system; aft bay clean-ups; auxiliary power unit flush. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 4, 1992.]

September 5:

LEVITT WINS SILVER SNOOPY

Jeff Levitt, a McDonnell Douglas Space Systems employee for the last 10 years, received the Silver Snoopy Award recently from astronaut James H. Newman. Levitt was rewarded for his role in troubleshooting a problem with the Hubble Space Telescope. George Faenza, Vice President and General Manager of McDonnell Douglas at KSC said, "Jeff is the embodiment of an aggressive, exceptional engineer who taught the principles of Total Quality Management long before TQM became our performance standard." "KSC Worker Pinned With Snoopy Award," FLORIDA TODAY, p. 9E, Sept. 6, 1992; SEE ALSO: Eisler, FLORIDA TODAY, p. 1A-2A, Dec. 12, 1992.]

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DRAG CHUTE TEST PLANNED

Referring to the special drag chute test which will be performed at the landing of Endeavour, NASA spokeswoman Karl Fluegel said, "This is the first test of the drag chute in an operational sense." All Orbiters will be fitted with drag chutes as part of modifications mandated after the Challenger accident. Two limited tests of the drag chute have been performed - on Endeavour and Columbia - during which the chute was deployed only after the nose wheel had touched down on the runway. [Halvorson, FLORIDA TODAY, p. 10E, Sept. 6, 1992.]

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SHUTTLE UPDATES

Endeavour is at Launch Complex 39B where technicians are readying the Orbiter for its week-long Spacelab-Japan mission. The seven-member crew will arrive at KSC on September 9, just after the countdown for the STS 47 mission has begun. Atlantis is in OPF Bay 2 where workers are preparing the vehicle for a year of modifications at Rockwell International's Palmdale, CA, plant. Atlantis will be ferried to California aboard the Shuttle Carrier Aircraft next month. Discovery is being processed in OPF Bay 3. In November the Orbiter will fly a classified mission for the Department of Defense. Columbia, the senior Space Shuttle, is being processed for a flight scheduled for next month, STS 52. Currently technicians are working on the vehicle's hydraulic system and checking connections on the Shuttle's three main engines. ["Orbiter Update," FLORIDA TODAY, p. 10E, Sept. 6, 1992.]

September 6:

DELTA/ENDEAVOUR LAUNCH THIS WEEK

In the early morning hours of September 9, a Delta 2 launch vehicle will lift off from Cape Canaveral Air Force Station's LC 17; the Delta's window extends from 4:57 a.m. until 5:24 a.m. The Air Force rocket will orbit the 15th Navstar satellite, part of the Navstar Global Positioning System Satellite Network. In the mid-morning of September 12, NASA will launch Endeavour on its second Shuttle mission, STS 47. Endeavour's window is from 10:23 a.m. until 12:53 p.m. [Brown, FLORIDA TODAY, p. 1A, Sept. 7, 1992.]

September 8:

STS 47: WEATHER LOOKS GOOD

Forecasters are predicting an 80 percent chance of having acceptable weather conditions at launch time on September 12. Crew members are scheduled to arrive September 9 at the Shuttle Landing Facility. Work in progress: preparations to start the STS 47 launch countdown; purges of the external tank; pulling work platforms out of the aft compartment; stowing gear in the crew module. Work scheduled: installation of aft compartment doors for flight is planned for tonight; begin launch countdown at 0300 tomorrow; move rotating service structure away from the vehicle at 1100 September 11; loading of hypergolic cryogenic propellants into the external tank at 0203 September 12; launch at 10:23 a.m. EDT September 12. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 8, 1992.]

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OPF PROCESSING ACTIVITIES

While the youngest Orbiter in the Space Shuttle fleet - Endeavour - is being readied for its STS 47 launch on September 12, the other three vehicles are each in an Orbiter Processing Bay undergoing Shuttle Processing Operations. Columbia is in OPF Bay 1 where the following processing work was in progress: checking out the forward reaction control system; verification of the remote manipulator system (RMS); minor repair of radiators; closeouts of the vehicle; main engine interface leak checks. Discovery, in OPF Bay 3, had leak tests of the crew module completed. Work in progress: leak and functional tests of the auxiliary power units; installation of its drag chute; integrated testing of the main propulsion system; testing of the vehicle's Ku-band antenna. Atlantis, being readied for its ferry flight to California for intensive modifications, is housed in OPF Bay 2 where it is undergoing preparations to flush the auxiliary power units; preparations to deservice the freon cooling system; removal of tacan antennas and the radar altimeter. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 8, 1992.]

September 9:

DELTA LAUNCH A SUCCESS

At 4:57 a.m., the Air Force launched a Delta II rocket from Cape Canaveral Air Force Station's Launch Complex 17. The rocket carried a NAVSTAR Global Positioning System Satellite into orbit, the fifteenth such satellite in the system. "We're a pretty happy bunch of people at this point," said flight commentator Skip Mackey. The launch was the 15th successful liftoff of Navstar satellites. It was the second Delta launch from Cape Canaveral in 10 days. The Air Force and the 45th Space Wing at Patrick Air Force Base will now be prepared to assist at Eastern Test Range for the launch of Endeavour on Saturday morning. [Banke, FLORIDA TODAY, p. 1A, Sept. 8, 1992; "Delta Rocket Scheduled to Lift Navigation Satellite Into Orbit," FLORIDA TODAY, p. 6A, Sept. 9, 1992; Halvorson, FLORIDA TODAY, p. 2A, Sept. 10, 1992.]

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STS 47 CREW ARRIVES AT KSC TODAY

The seven-member crew of the Space Shuttle Endeavour arrived at Kennedy Space Center's Shuttle Landing Facility this morning at approximately 8:30 a.m. "We're all excited about the idea of getting ready to go into space," said Commander Robert L. "Hoot" Gibson. "We think we have some exciting things we are going to get a chance to look into and investigate." The crew also includes Pilot Curtis L. Brown, Jr. and Mission Specialists Jay Apt, Mae C. Jemison, Mark C. Lee and N. Jan Davis (who will be the first married couple in space) and Mamoru Mohri, a Japanese astronaut. Apt, Jemison and

Davis, will bed down shortly after arrival, while the remainder of the crew will eat lunch and attend Shuttle and payload status briefings. "They are getting acclimated to the schedule they'll be working during the flight," said KSC spokeswoman Lisa Malone. Asked about progress in pre-launch operations, Malone said, "We're doing great at the pad. We're pressing on for a launch Saturday [September 12] and we don't expect any problems." If the launch goes as scheduled, a landing would occur at KSC at 6:59 a.m. on September 19. The three-day countdown also got underway today at . [Halvorsen, FLORIDA TODAY, p. 6A, Sept. 9, 1992; Halvorsen, FLORIDA TODAY, p. 2A, Sept. 10, 1992; Hoversten, USA TODAY, p. 2A, Sept. 11, 1992.]

September 10:

QUAYLE TO WITNESS STS 47 LAUNCH

Vice President J. Danforth Quayle will be on hand at Kennedy Space Center to witness the second launch of Endeavour on its STS 47 mission September 12. The vice president will meet with the families of the STS 47 crew before the launch; after the liftoff he will address the launch team. "We're looking forward to eating beans with the vice president," said Shuttle Launch Director Robert B. Sieck. A meal of beans and cornbread is a tradition following every Shuttle launch. Quayle is chairman of the National Space Council and has visited KSC twice previously, in February and May 1991. After the launch, the Quayles will fly to South Florida to tour the hurricane damage in Homestead, FL. ["KSC Readies for Quayle Visit," FLORIDA TODAY, p. 2A, Sept. 10, 1992; OFFICE OF THE VICE PRESIDENT, "Visit of the Vice President and Mrs. Quayle to Cape Canaveral, Florida, Sept. 12, 1992; Banke, FLORIDA TODAY, p. 1A, Sept. 11, 1992.]

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HYDROGEN REACTANTS LOADED

Technicians at Launch Complex 39B have loaded liquid oxygen and liquid hydrogen reactants into Endeavour for use by the fuel cells. STS 47 remains on target for a September 12 liftoff. Crew activities: Commander Robert L. "Hoot" Gibson and Pilot Curtis L. Brown, Jr. flew in the Shuttle Training Aircraft this morning. Crew members receive a medical exam today, review flight data files and collect baseline data. Work in progress: preparations to disconnect the Orbiter midbody umbilical unit used to load cryogenic reactants into the Orbiter's onboard fuel cell storage tanks; activation of the Orbiter's communications system; preparations to load time critical experiments into the Spacelab module including the frogs and fish; countdown clock enters a planned 4-hour built-in hold at the T-19 mark. Loading the animals into Endeavour requires that two McDonnell Douglas Space Systems technicians be lowered by rope from the crew cabin down a 20-foot-long tunnel to the opening of the Spacelab. Work scheduled: moving the rotating service structure away from the vehicle at 1100 a.m. September 11; begin loading cryogenic propellants into the external tank at 0203 September 12; crew wake-up time on September 12 is at 4:58 a.m. for the blue team and at 5:28 a.m. for the red team; crew breakfast is at 5:58 a.m. September 12 with departure of the flight crew for the LC 39B at 7:08 a.m. Launch is set for 10:23 a.m. EDT September 12. Forecasters are predicting an 80 percent chance of having acceptable conditions at launch time. The main weather concern is thunderstorms and the clouds left over after the storms dissipate. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 10, 1992; Banke, FLORIDA TODAY, p. 7A, Sept. 11, 1992.]

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COLUMBIA: STS 52 PROCESSING

TACANS number 1 and 3 are being replaced on Columbia while the Orbiter is being processed for STS 52 in OPF Bay 1. Other work in progress: checkout of the forward reaction control system; tests of the robot arm; closeouts of the vehicle; main engine interface leak checks. Work scheduled: transfer of the Orbiter to the Vehicle Assembly Building next week for mate with the external tank and boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 10, 1992.]

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DISCOVERY: DRAG CHUTE DOOR INSTALLED

In OPF Bay 3 technicians have installed Discovery's drag chute door. Work in progress: electrical redundancy testing of the orbital maneuvering system and reaction control system; leak and functional tests of the auxiliary power units; integrated testing of the main propulsion system; testing of the Ku-band antenna. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 10, 1992.]

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ATLANTIS: MODIFICATION PERIOD CONTINUES

Technicians have flushed the auxiliary power units of Atlantis while the Orbiter in OPF Bay 2 awaits its ferry flight to Palmdale, CA, for extensive modifications. Other work in progress on the vehicle: transfer of the power reactant storage and distribution system tanks to the Logistics Facility for storage; removal of auxiliary power unit lines; preparations to deservice freon cooling system; removing TACAN antennas and the radar altimeter. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 10, 1992.]

September 12:

50TH SHUTTLE LAUNCH SUCCESSFUL

Endeavour's launch was the first post-Challenger Shuttle launch to take place on time at 10:23 a.m. EDT. Mission Specialist Jay Apt said, "I've got to tell you this is a great way to commute to work." NASA spokesman James Hartsfield said, "It was loud - louder than normal." Giselle Altmann, a receptionist at Kennedy Space Center said, "It was awesome. I enjoy the feel of the launch more than the visual aspect. The Earth shaking, car alarms ringing. I call it 'rolling thunder'." Next to God, it's the most powerful thing I know." Launch Director Robert B. Sieck noted that the launch was merely seven-hundredths of a second late. He said, "Looks close enough for government work." [Halvorson, FLORIDA TODAY, pp. 1A-2A, Sept. 13, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-15, Sept. 13, 1992; KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 14, 1992.]

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QUAYLE: 'GOOD LUCK AND GODSPEED'

Vice President J. Danforth Quayle was on hand today to view the Shuttle Endeavour's second launch. About 20 minutes before launch, the vice president radioed to the crew: "On behalf of the president and all Americans, we just wish you and your crew good luck and Godspeed. We know it's going to be great." Mission Commander Robert L. "Hoot" Gibson replied, "Thank you, sir. We very much appreciate your support and we look forward to having a safe and successful 50th launch of the Space Shuttle by the world's greatest launch team and we're very pleased to have you here today." [Coleman and Halvorson, FLORIDA TODAY, p. 1A, Sept. 13, 1992.]

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LOCKHEED WORKERS HONORED

Bryan Baker (Edgewater, FL) was named Lockheed Space Operations Co.'s Employee of the Month and Stephen Leonhard (Mims, FL) was named the company's Supervisor of the Month. Baker has worked at Kennedy Space Center for 26 years and Leonhard has spent 13 years at KSC. Leonhard said, "It makes you feel like they appreciate the work you do." ["2 KSC Workers Honored," FLORIDA TODAY, p. 9E, Sept. 13, 1992.]

September 14:

POST-LAUNCH REPORT

For the first time since STS 61-B, a Shuttle was launched on time Saturday at 10:23:00.0600 a.m. EDT. Endeavour's second launch marked NASA's 50th Space Shuttle launch. The STS 47 solid rocket boosters arrived at Hangar AF on Cape Canaveral Air Force Station at 16 and 1830 yesterday. Both boosters are secured in the work stands and engineers are performing an open assessment today. A preliminary look at the boosters indicates they are in good condition. Launch Complex 39B sustained a minimal amount of damage as a result of Saturday's launch. Mobile launcher platform number 2 will be moved from the pad to the refurbishment site tomorrow. Endeavour is scheduled to land on Saturday (September 19) at Kennedy Space Center's Shuttle Landing Facility at 6:59 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 14, 1992.]

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COLUMBIA: LEAK CHECKS COMPLETED

In the course of preparing Columbia for its STS 52 mission, technicians have completed leak checks of the vehicle's crew module. Work in progress: cleaning of the payload bay; closeouts of the vehicle; tests of the hydraulic system; troubleshooting of the water system for the crystals by vapor transport experiment located in the middeck. Columbia's transfer from OPF Bay 1 to the Vehicle Assembly Building will occur September 18. Once in the VAB, Columbia will be bolted to its external tank and boosters. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 14, 1992.]

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DISCOVERY/ATLANTIS PROCESSING

Discovery continues to undergo processing in OPF Bay 3. Work in progress: preparations to remove the left orbital maneuvering system pod for repairs of an oxidizer isolation valve. The pod will be transferred to the Hypergolic Maintenance Facility where repairs will be made. Other work: servicing of the potable water; testing of the Ku-band antenna; replacement of a regulator for a water spray boiler. Atlantis is in a modification period at KSC before its ferry flight to California for extensive changes and improvements. Work in progress: preparations to deservice the freon cooling system; removal of various components. Atlantis will be ferried to Palmdale, CA, in mid-October. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 14, 1992.]

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LEE MADE PROCUREMENT DEPUTY

NASA Administrator Daniel S. Goldin announced today the appointment of Deidre A. Lee, a veteran aerospace acquisitions officer, as Deputy Assistant Administrator for Procurement. Lee, who managed a variety of procurement activities in both NASA and the Air Force, currently serves as the Executive Officer to NASA's Acting Deputy Administrator Aaron Cohen. "We are very fortunate to have a person with Deidre Lee's considerable experience and energy to fill this position at a time when we are undertaking

major reforms in NASA procurement activities," Goldin said. [NASA/KSC News Release No. 92-146, Sept. 14, 1992.]

September 15:

HANGAR AF: BOOSTERS STRIPPED

At Hangar AF, blasts of high power water are stripping the exterior cork and thermal protective foam away from Endeavour's boosters' aft skirts. Both boosters will be disassembled and shipped back to the respective vendors for refurbishment. Mobile launcher platform number 2 will be moved from the pad to the refurbishment site tomorrow. Endeavour's landing continues to be scheduled for September 19 at Kennedy Space Center's Shuttle Landing Facility at 6:59 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 15, 1992.]

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COLUMBIA: PREPARATIONS IN OPF BAY 1

Technicians are preparing Columbia for its STS 52 flight in Orbiter Processing Facility Bay 1. Work in progress: cleaning of the payload bay; closeouts of the vehicle; tests of the hydraulic system; preparations to replace the water accumulator for the crystals by vapor transport experiment located in the middeck. Transfer of the Orbiter to the VAB will occur no earlier than 0001 September 19; Columbia will then be bolted to its external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 15, 1992.]

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DISCOVERY: OPF BAY 3 PROCESSING

Discovery is in OPF Bay 3; work in progress: preparations to remove the left orbital maneuvering system pod for repairs of an oxidizer isolation valve; transfer of left OMS pod to Hypergolic Maintenance Facility for repairs; leak and functional tests of the ammonia system; servicing of freon coolant loop number 1; servicing of the potable water; replacement of a regulator for a water spray boiler. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 15, 1992.]

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ATLANTIS: MODIFICATIONS AT KSC CONTINUE

The Space Shuttle Atlantis began a period of modification at the conclusion of its recent STS 46 mission. Work in progress: installation of the forward reaction control simulator; preparations to deservice the freon cooling system; removal of various components. In mid-October, the vehicle will be shipped to Rockwell International's Palmdale, CA, plant for further, more intensive modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 15, 1992.]

September 16:

ENDEAVOUR: LANDING LATE

Hydrolasing activities are continuing on the boosters to remove exterior cork and thermal protective foam. Both boosters will be disassembled and shipped back to the respective vendors for refurbishment. Mobile launcher platform number 2 was moved from the pad to the refurbishment site yesterday. Endeavour's STS 49 mission has been extended one day pushing landing at Kennedy Space Center's Shuttle Landing Facility to Sunday morning at 7: 22 a.m. The extension was authorized to allow the astronauts more time to run experiments. "You have another 24 hours to enjoy those aurora," said astronaut Charles D. "Sam" Gerns speaking to the Endeavour crew from Mission Control in Houston. Commander Robert L. "Hoot" Gibson responded: "Gee Sam, everybody's frowning." [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 16, 1992.]

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COLUMBIA: OPF BAY 1 PROCESSING

The Space Shuttle Columbia continues to undergo processing prior to its STS 52 mission. In OPF Bay 1 the work in progress includes: cleaning of the payload bay; closeouts of the vehicle; final brazing of gaseous nitrogen lines in the aft compartment; replacement of the water accumulator for the crystals by vapor transport experiment located in the middeck. Work scheduled: transfer of Columbia to the Vehicle Assembly Building no earlier than 0001 September 20 when the Orbiter will be mated to its external tank and solid rocket boosters; the STS 52 flight readiness review is set for October 1 and the launch is tentatively targeted for mid-October. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 16, 1992.]

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DISCOVERY: SERVICING/TESTING COMPONENTS

Preparations are underway in OPF Bay 3 to remove Discovery's left orbital maneuvering system (OMS) pod for repairs of an oxidizer isolation valve; the pod goes to the HMF for completion of the repair work. Other work in progress: tests of the Ku-band antenna; electrical redundancy tests of the OMS and reaction control systems; leak and functional tests of the ammonia system; preparations to connect the auxiliary power unit lines; servicing of the freon coolant loop number 1 and the potable water. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 16, 1992.]

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MODIFICATION OF ATLANTIS CONTINUES

In OPF Bay 2, Atlantis continues in the early phases of the major modification work which will be continued in mid-October in Palmdale, CA. Work in progress at KSC: installing the reinforced carbon chin panel; preparations to deservice the freon cooling system; tests of the main propulsion system. The installation of the forward reaction control simulator. Atlantis will be ferried to California on October 17. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 16, 1992.]

September 17:

CRIPPEN TO BRIEF NEWS MEDIA

Several times a year Kennedy Space Center Director Robert L. Crippen meets with editors and other members of the media who are interested in what is happening at the space center, but do not get a chance to talk to him regularly. Crippen's next such meeting with the press is set for the afternoon of September 21 at 1:30. [NASA/KSC Release No. 126-92, Sept. 17, 1992.]

September 18:

ENDEAVOUR'S LANDING PLANS/KSC

The Space Shuttle Endeavour is scheduled to land at Kennedy Space Center September 20, after spending eight days in space on Shuttle mission STS 47. The landing will mark the conclusion of the Orbiter's second mission which began at KSC on September 12. Landing had earlier been slated for September 19, but was extended to gather more science data. Landing of Endeavour at KSC's Shuttle Landing Facility (SLF) is currently planned for 7:19 a.m. EDT on orbit 126. Landing on that schedule will bring mission elapsed time to 7 days, 20 hours and 56 minutes. Deorbit burn is set to occur on orbit 125 at about 6:19 a.m. at 7 days, 19 hours and 56 minutes. There is a second landing opportunity at KSC at 8:53 a.m. on orbit 127. [See landing story below.] The main weather concern is the possibility of rain within 30 miles of Kennedy Space Center's Shuttle Landing Facility, according to Gary Coen, mission operations manager at Johnson

Space Center (Houston, TX). The decision to land will be made about 100 minutes before the scheduled touchdown; Coen added that it was very likely that the first landing opportunity would be bypassed. Two landing opportunities are also available at KSC on September 21, at 7:13 a.m. and 8:46 a.m. Should weather prevent a landing at Kennedy, opportunities are also available at Edwards Air Force Base, CA, on September 20 and 21, at 10:23 and 11:57 a.m. and 10:14 and 11:47 a.m., respectively.

KSC Ground Operations

Once the Orbiter is on the ground, safing operations commence and the flight crew will prepare the vehicle for post-landing operations. A new transport vehicle will be used for the first time on this mission; it will assist the crew by allowing them to egress and changeout of the re-entry suits more easily and quicker. This vehicle, called the Crew Transport Vehicle (CTV), was purchased from Continental Airlines at Denver for use at KSC. A similar CTV will be on hand at Edwards. The CTV and other KSC landing convoy operations have been in an "on-call" status since Endeavour launched September 12. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the Orbiter after landing, prepare the Orbiter for towing to the OPF and assist crew egress.

Convoy vehicles are stationed midway along the SLF. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the Orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant Umbilical Access Vehicles move into position at the rear of the Orbiter. After purge and coolant operations, flight crew egress preparations will begin and the CTV is moved into position at the crew access hatch located on the Orbiter's port side.

Once access to the vehicle is gained, a doctor will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle. Several hours after landing, the Orbiter will be towed to OPF Bay 1 for post-flight deservicing and preparations for the next mission, STS 54. Following departure from the SLF, the seven astronauts will be taken to their quarters in the O & C Building, meet with their families, undergo additional physical examinations and depart for the skid strip at Cape Canaveral Air Force Station for their flight back to JSC. The crew intends to depart for JSC about eight hours after landing. In the event a landing at KSC is not feasible and Endeavour lands at Edwards, an augmented KSC convoy team will be at the California site to safe the vehicle, disembark the crew and move the Orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day. [NASA/KSC News Release No. 129-92, Sept. 18, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 18, 1992.]

I

COLUMBIA: PAYLOADS TO LC 39B

The payloads for Columbia's STS 52 mission have been transferred to Launch Complex 39B and the Orbiter's payload bay doors have been closed. Work in progress: repairing an hydraulic leak in the elevon actuator line; preparations for the positive pressure structural leak test; closeouts of the vehicle; transferring the STS 52 payloads into the Payload Changeout Room at LC 39B. Work scheduled: weight and center of gravity determination tomorrow; transfer of Columbia to the Vehicle Assembly Building September

20 for mating with its external tank and solid rocket boosters; flight readiness review in early October; launch in mid-October. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 18, 1992.]

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DISCOVERY & ATLANTIS: PROCESSING ACTIVITIES

Discovery, in OPF Bay 3, is having its orbital maneuvering system crossfeed lines disconnected. The Orbiter is undergoing leak and functional tests of the auxiliary power units and is being prepared for removal of the left orbital maneuvering system (OMS) pod for repair of the system's oxidizer isolation valve. The pod itself will be transferred to the Hypergolic Maintenance Facility for repairs. Atlantis, in OPF Bay 2, is having its residual oxidizer and fuel hypergolic propellants offloaded. Both OPF bays 1 and 2 are closed to non-essential personnel both today and tomorrow during the hazardous operation. Atlantis work scheduled: tests of the OMS pods next week; deployment of the radiators next week; removal of fuel cells and installation of simulators in their place. The cross-country ferry to Palmdale, CA, is scheduled to start October 17. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 18, 1992.]

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NASA/EPCOT: PLANT BIOLOGY EXPERIMENTATION

The time when astronauts will be required to grow their own food in space may still be many years away, but a pair of scientists from NASA's Kennedy Space Center and Walt Disney World's EPCOT Center are already mixing soil, planting crops and preparing for humankind's long-distance voyages of the future. Their goal is to see that food is not an issue when astronauts once again leave Earth orbit and move on to the moon, Mars or beyond. The arrangement involves two of Central Florida's largest employers dedicating two of their most highly educated employees to a project in a field where neither conglomerate is best known. Chris Brown, Ph. D., a plant physiologist with The Bionetics Corporation, and Andrew Schuerger, Ph. D., plant pathologist based at The Land pavilion at EPCOT Center, joined forces just over a year ago and have since been experimenting with lighting, plants and various types of growing environments.

Working in a laboratory near The Land pavilion, Brown and Schuerger have not only studied plant development but also new ways of growing them. They are focusing on artificial lighting used to nourish and stimulate the plants. Rather than relying on fluorescent or high-pressure sodium lights which have been used before, the two scientists are instead using light emitting diodes (LEDs) - like those used to illuminate digital clocks and watches - to stimulate their crops. The two scientists are using blue and red light.

With a limited area to grow plants on Space Station Freedom, Brown and Schuerger were forced to modify their approach to the project. "Sodium or fluorescent lights work great in indoor laboratories here on Earth, but we're going to have some substantially different circumstances once we start growing plants in space," said Brown. "The presence of humans and a less than ideal environment provides us with some unique challenges." Those challenges center around the intensity and types of lighting needed to invigorate and sustain plant life. Typical greenhouse lighting was bypassed because they produce short lifespans, poor energy efficiency, safety concerns with fragile glass lights and an intolerable amount of heat output. The idea of using LEDs as an artificial light source for plants is not a new one. Developed and marketed by Quantum Devices, Inc. (Barneveld, WS), the growth-spurring LEDs were first studied at NASA's Ames Research Center. Experimental studies have been undertaken by a handful of researchers from various

universities and private institutions, but none are known to be as extensive or fruitful as those conducted by Brown and Schuerger.

The LEDs are being tested for their usefulness in spaceships, but spin-offs of the research conducted by Brown and Schuerger will likely someday find its way into the commercial marketplace. The miniature LEDs - which can generate up to 1/2 the light intensity of mid-day sunlight - may have uses in commercial gardening, pest management and experimental growth chambers. "The technology is still early in the development, but I think LEDs could have far-reaching implications," said Brown. Schuerger added, "We're delving into a new area of plant research here. I'm involved because EPCOT Center and The Land pavilion are dedicated to the future and particularly futuristic research....It may be a while before the results of our studies fly in space or before their spin-offs are in your local garden shop, but we're confident that those days will come." [NASA/KSC News Release No. 128-92, Sept. 18, 1992.]

September 19:

WOODWORTH NAMED HONOREE

Warren Woodworth (Lockheed Space Operations Co. engineer) has been named a 1992 Manned Space Flight Awareness honoree. He was given the award for his contributions as the Orbiter airframe structural lead engineer for Endeavour. ["Lockheed Engineer Wins Award," Photo, FLORIDA TODAY, p. 9E, Sept. 20, 1992.]

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ADMINISTRATOR GOLDIN TO SPEAK LOCALLY

NASA Administrator Daniel S. Goldin will speak September 22 at the Brevard County Manufacturers Association and the Brevard Economic Development Corporation's Industry Appreciation '92. The dinner is to be held at 6:30 p.m. at the Cocoa Beach Hilton. ["Goldin to Speak at Industry Appreciation," FLORIDA TODAY, p. 9E, Sept. 20, 1992.]

September 21:

ENDEAVOUR LANDS AT KSC

"Like they say in the commercial, 'it doesn't get any better than this'," said Kennedy Space Center Director Robert L. Crippen when Endeavour ended its eight-day STS 47 mission yesterday. Touchdown came at 8:53:24 a.m. EDT; it was a successful conclusion to the 50th Space Shuttle mission. Endeavour Commander Robert L. "Hoot" Gibson remarked after the landing, "We got to go have the fun. We got to go do the good part, but we very much appreciate what the Kennedy Space Center - the world's greatest launch team - did for us. They're now turning Endeavour around for the next mission. So, the mission is over and the mission continues."

Endeavour's landing was on Runway 33; the drag chute was deployed at touchdown and the total rollout distance was approximately 8,567 feet. This landing marked the 12th Shuttle landing at KSC. Nose gear touchdown came at 8:53:41 and wheels stopped at 8:54:11 a.m. The total mission elapsed time was 7 days, 22 hours, 31 minutes and 11 seconds. Endeavour logged at total of 3,310,922 million miles in space during its second flight. The vehicle was safed on the runway and Endeavour was parked inside the OPF by 3:47 p.m. Time-critical experiments were removed from the Orbiter overnight. Post-flight inspections and deservicing operations are underway.

Residual cryogenic propellants will be offloaded tonight; main engine drying operations are scheduled to begin today. Preliminary inspections indicate the vehicle sustained minor tile damage. Two tiles were damaged when the drag chute was deployed and two

tiles on the nose landing gear door may have to be replaced. Overall the vehicle appears to be in good shape. Access is being established to all areas of the vehicle. Preparations are in work to open the payload bay doors tomorrow. Removal of the Spacelab-J payload is set for Friday, September 25. [Brown, FLORIDA TODAY, pp. 1A-2A, Sept. 21, 1992; KSC SHUTTLE STATUS REPORT, September 21, 1992.]

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COLUMBIA MOVED TO VAB

The Space Shuttle Columbia, the next Orbiter that KSC will send into space, was transferred to the Vehicle Assembly Building by 1:10 p.m. yesterday (September 20). Today technicians hoisted the vehicle above the transfer aisle floor and into high bay 1 where it will be bolted to its external tank and solid rocket boosters. Work scheduled: rollout to Launch Complex 39B is targeted for September 26. A terminal countdown demonstration test is set for October 1-2, followed by a flight readiness review and launch by mid-October. [KSC SHUTTLE STATUS REPORT, Sept. 21, 1992.]

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DISCOVERY IN OPF BAY 3

Preparations are underway to remove the left orbital maneuvering system (OMS) pod of Discovery for repairs of an oxidizer isolation valve. The pod will be transferred to the Hypergolic Maintenance Facility where the actual repair work will be done. Discovery's landing gear struts are being pressurized for flight; the main landing gear wheels and tires are being installed and leak checks of the liquid hydrogen main propulsion system are underway. [KSC SHUTTLE STATUS REPORT, Sept. 21, 1992.]

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ATLANTIS: OPF BAY 2 MODIFICATIONS

In OPF Bay 2, Atlantis is undergoing tests of the orbital maneuvering system pods; preparations to remove the fuel cells and star trackers and deservicing of freon coolant loop number 1. Work scheduled: deployment of the radiators this week; removal of fuel cells and installation of simulators in their place. Atlantis' ferry flight to Palmdale, CA, is set for October 17. [KSC SHUTTLE STATUS REPORT, Sept. 21, 1992.]

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ENDEAVOUR 'LOOKS CLEAN'

"It looks clean. It really does," said Endeavour's Processing Manager John "Tip" Talone the day after Endeavour landed at Kennedy Space Center. "It's in real good shape." He said that of the 30,00 tiles covering the vehicle, only four need replacement. All the animals which flew aboard the vehicle in experiments have been removed from the payload bay. These included: 155 tadpoles conceived in space and seven hatched in flight; 180 hornets; 7,600 fruit flies and 30 chicken eggs. Endeavour's next mission is scheduled tentatively for January 13. [Brown, FLORIDA TODAY, p. 1A, Sept. 22, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Sept. 21, 1992.]

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DISCOVERY: O-RING LEAK FOUND

A leak similar to the one that caused the Challenger accident has been spotted in a booster intended for the use of Discovery on its next mission. Early on the 18th a test showed that one of three o-rings was leaking slightly. Finding out which ring is leaking and why could delay Discovery's launch now tentatively set for November 10, according to Director of Shuttle Operations Jim Harrington. He said that the recent test was the first time a joint between segments had failed a check since flights resumed in 1988.

Harrington noted that the leak was tiny; it could not be seen or heard without special instrumentation. It was discovered because of a drop in pressure. Sensitive sound detectors will be used to locate the leak, he said. The joints have "all kinds of redundancy in there," said Harrington. He said, further, that the segments used on the redesigned rockets were safer than those used on Challenger. KSC Director Robert L. Crippen said that test directors don't want to use the SRBs unless every o-ring passes inspection. [Date, THE ORLANDO SENTINEL, pp. A-1 & A-10, Sept. 22, 1992.]

September 22:

SRB LEAK OBSERVED

As part of the booster assembly process at Kennedy Space Center, special equipment is used to check for minute leakage past o-rings in the field joints. During these standard leak check operations on the right-center field joint of the STS 53 solid rocket boosters, a leak was observed by test engineers at the primary o-ring seal. As planned for contingencies such as this leak check anomaly, engineers are scheduled to de-stack the booster segment to inspect the seal and determine the cause of the leak. The o-ring will be replaced and engineers will conduct a thorough inspection and analysis of the original o-ring. Potential causes for the leak could include debris, contamination or improper seating of the o-ring. Cleanliness and contamination control precautions are emphasized during the assembly procedure and have been effective for the previous 150 field joint assemblies for the 25 flights of the redesigned solid rocket motors. In this instance the leak check performed its function by identifying an unusual condition which is being investigated.

"It's a small leak - most likely less than one-thousandth of an inch in diameter," according to NASA Project Engineer Phil Weber. "It's not audible, and it's not a physical, blowing leak. It's very possible that we may disassemble (the segment) and not even find anything wrong. We deal with problems with flight hardware on a day-to-day basis. That's what we do out here. The key is you have to have the procedure in place. It wasn't a big shock (when we found the leak.) We knew what to do," Weber said.

The leak check is performed on all field joints as part of the assembly process in stacking the boosters for flight. The test includes imposing high-pressure (1,000 psi) between the secondary and primary o-ring seals. Engineers monitor for any pressure increase between the capture feature seal and the primary. If any changes in pressure are noted during this test, the primary seal is suspect and fails the test. Leak checks are also performed at lower pressures, between the secondary and primary seals, and between the capture feature and primary seals. These follow on checks are performed only after passing the initial leak checks. Successful completion of the leak check procedures provides the final assurance that the assembled RSRM fully meets seal requirements. The STS 53 mission is currently targeted for a mid-November launch; impact of the destacking and o-ring replacement on the target launch date, if any, is still being assessed. ["STS 53 Redesign Solid Rocket Motor Stacking Operations," Sept. 23, 1992; Brown, FLORIDA TODAY, p. 4A, Sept. 23, 1992; Date, THE ORLANDO SENTINEL, p. A-10, Sept. 23, 1992.]

I

CONGRESS: FREEDOM BUDGET NEARS APPROVAL

President Bush has won nearly all the money he sought for the budget of Space Station Freedom. Congressional negotiators for the House and Senate have agreed to a budget calling for the expenditure of \$2.1 billion. Bush had asked for \$2.2 billion. ["House-

Senate Negotiators Approve \$2.1 Billion for Space Station Freedom," FLORIDA TODAY, p. 4A, Sept. 23, 1992; Holton, THE ORLANDO SENTINEL, p. A-1, Sept. 24, 1992.]

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GOLDIN: PROCUREMENT RULES TO CHANGE

NASA Administrator Daniel S. Goldin said today that his agency's procurement rules will change to encourage small businesses to pursue contracts in the space program. "We need to open our arms to bring in small and disadvantaged businesses," he said. Goldin said he wanted to simplify procurement rules and set up an electronic bulletin board for companies to learn what NASA's needs are. "One of the challenges we face in our society is to focus not on our present problems, but on the future." ["NASA Chief Targets Small Businesses," FLORIDA TODAY, p. 2B, Sept. 23, 1992.]

September 23:

SRB UPDATE: STS 53

In the Vehicle Assembly Building high bay 3, workers began demating the two booster segments designated for the STS 53 mission last night. When the right forward center segment was demated from the right aft center segment this morning, a one-inch piece of one of the V-2 filler sections was found pinched between the tang and clevis. Officials have determined that this V-2 filler caused the leak that was detected September 18. Today's inspection of the three o-rings proved they were intact and undisturbed. No foreign debris or contamination was present in the joint. There are 8 sections of the V-2 filler sections that are held in position with grease and are press-fitted into place within the joint. The rubber V-2 filler sections are about four feet long, about a half inch wide and "U" shaped. The right forward center segment has been lowered down into the transfer aisle. Both joints are being cleaned, inspected and prepared for re-mate. New o-rings and V-2 filler sections will be installed. A leak check of the joint will be performed after the segments have been remated. The STS 53 mission is currently targeted for a mid-November launch. Impact of the destacking activities on the target launch date, if any, is still being assessed. ["STS-53 Solid Rocket Booster Update," 2 p.m., Sept. 23, 1992; Brown, FLORIDA TODAY, p. 4A, Sept. 24, 1992.]

September 24:

STS 52: MAIN ENGINE STATUS

Shuttle officials decided today to replace one of the three main engines (Engine Number 3) on Columbia during its stay at the launch pad. Columbia is scheduled to be transferred to Pad 39B at 12:01 a.m. October 3. It is expected that the engine replacement work will begin next week. After examining X-rays taken after manufacturing, engineers found indications of possible small cracks in the engine nozzle liquid hydrogen coolant manifold at the bottom of the nozzle. This manifold funnels supercold liquid hydrogen into tiny tubes inside the nozzle to provide cooling to the nozzle and other areas of the engine.

X-raying the areas of concern at the pad would require an involved process including removal of the main fuel valve. In the interest of time, another engine is being prepared in the Main Engine Shop for installation on Columbia. X-rays will be performed on a different area of main engine number 1 while the vehicle is in the VAB. Weld concerns on engine number 1 are in a different location than in engine number 3 and do not require removal of the main fuel valve. There are no concerns with engine number 2. Possible impacts to the STS 52 launch date, currently targeted for mid-October, are being assessed. ["STS 52 Main Engine Status," 4:30 p.m., Sept. 24, 1992.]

September 25:

COLUMBIA: ENGINE 3 A CONCERN

Yesterday, officials decided to replace main engine number 3 of Columbia because of concerns of small welds in the nozzle's aft manifold. Performing x-rays of this particular area is an involved task and would require a significant amount of time. After evaluating options, it was determined that replacing engine number 3 at the pad is the prudent thing to do. X-rays of welds in a different location in the engine number 1 aft manifold are being taken today. There are no concerns with engine number 2. Work in progress: preparations to transfer the Orbiter to Launch Complex 39B; retracting platforms away from the vehicle; defoaming around the main engine number 3 interfaces in preparation for removal next week; x-rays of the welds in the engine number 1 aft manifold. Work scheduled: rollout to LC 39B targeted for 0001 Saturday (October 3); hot fire of the auxiliary power units Saturday night; moving the rotating service structure in place around the vehicle at 0400 October 4; terminal countdown demonstration test set for October 1-2; a flight readiness review is set for October 6. Launch is still targeted for mid-October. Referring to the engine changeout, KSC spokeswoman Lisa Malone said today, "We should know more by the end of the week." [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992; Date, THE ORLANDO SENTINEL, p. A-4, Sept. 25, 1992; Banke, FLORIDA TODAY, p. 1A, Sept. 28, 1992; Halvorson, FLORIDA TODAY, p. 2A, Sept. 29, 1992.]

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TITAN LIFTS MARS OBSERVER TO MISSION

At 1:05 p.m. this afternoon, the Mars Observer Spacecraft atop a Titan 3 rocket was launched from Cape Canaveral Air Force Station's Launch Complex 40. The launch was held up for 38 minutes while last minute pad work was completed. Then, after launch, the mission was in danger of failure while ground controllers struggled for an hour to communicate with the probe's Transfer Orbit Stage Booster rocket. The remaining problems with the probe are considered minor and not a threat to the mission. Mars Observer Program Manager William Plotrowski said, "We expect to arrive at Mars with a fully functional spacecraft." A global survey of the planet is expected to commence in mid-December 1993. [Banke, FLORIDA TODAY, p. 1A, Sept. 25, 1992; Banke, FLORIDA TODAY, p. 1A, Sept. 26, 1992; Banke, FLORIDA TODAY, p. 1A, Sept. 27, 1992; Hoversten, USA TODAY, p. 8A, Sept. 24, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Sept. 25, 1992.]

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DISCOVERY: CHECKS AND INSPECTIONS

In OPF Bay 3, technicians are at work on Discovery connecting auxiliary power unit fuel tank lines; servicing the potable water system; performing leak checks of the liquid hydrogen main propulsion system; preparing to replace a relief valve in the ammonia system and inspecting solenoid valves in the main propulsion system. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992.]

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ATLANTIS: MODIFICATIONS CONTINUE

Technicians have completed removal of the left orbital maneuvering system pod and the star trackers from Atlantis; they have also deserviced the Orbiter's freon coolant loop number 1. Work in progress: disconnecting the radiators for inspections; preparations to remove the right orbital maneuvering system pod and removing the auxiliary power unit controllers. Work scheduled: removing the radiators this weekend; ferrying Atlantis to Palmdale, CA, set for October 17. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992.]

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ENDEAVOUR: POST-FLIGHT INSPECTIONS, TESTS

Post-flight inspections and tests are the order of the day for the Space Shuttle Endeavour which has just completed its STS 47 mission with a landing at KSC. Other work in progress: validations of the Orbiter's power system; inspections of the windows; leak and functional tests of the main propulsion system helium system. On Endeavour's next mission, STS 54, a TDRS-F satellite will be deployed. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992.]

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STS 53 BOOSTERS

Work in progress on the STS 53 boosters includes: lifting the right forward center segment to the high bay for mating to the right center segment. The two segments are expected to be re-mated by tomorrow and a leak check will follow. The STS 53 mission is currently targeted for a mid-November launch; the impact of the destacking on the target launch date, if any, is still being assessed. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992.]

September 26:

ROCKWELL GETS KSC QUALITY AWARD

This year's Kennedy Space Center Excellence Award for Quality has been given to Rockwell International Corp., Space Systems Division Field Operations. A letter to Rockwell from KSC Director Robert L. Crippen to Rockwell Vice President and General Manager Leroy D. Solid said, "Your quality organization, in support of the Kennedy Space Center's Shuttle operations, was judged to be truly worthy of this prestigious award." Solid said, in reply, "Manned space flight demands a culture based on quality above all other considerations. It is gratifying to see Rockwell recognized for putting quality first." The award will be presented in October. ["Rockwell International Space Systems Receives KSC Excellence Award," FLORIDA TODAY, p. 2B, Sept. 26, 1992.]

September 28:

JOB CUTS STILL FORECAST

Despite nearly complete funding for most of NASA's major programs, job cuts in the Shuttle Program are still forecast. John Williams, Lockheed Space Operations Co. spokesman said, "The budget is very positive as far as the long-term health of the Space Shuttle Program and the Space Station Program, which is good news for Brevard County." Nevertheless, Lockheed is anticipating layoffs in the range of 200 to 300 persons from its 6,000-plus work force. Most job losses, according to Williams, will come as the result of attrition. [Halvorson, FLORIDA TODAY, p. 1A, Sept. 29, 1992; Date, THE ORLANDO SENTINEL, p. A-13, Sept. 30, 1992.]

September 29:

COLUMBIA: ENGINE 3 REMOVAL

Technicians at Launch Complex 39B have finished removing the heat shield from around main engine number 3 and have opened Columbia's payload bay doors to receive the STS 52 payload. The welds in main engine number 1 aft manifold show that there is no indication of defects; this was verified by X-raying the relevant components. Work in progress: removal of main engine number 3 from Columbia this afternoon and transfer of the payload into the Orbiter. Work scheduled: installation of replacement main engine number 3 tomorrow; launch readiness review for STS 52 tomorrow; terminal countdown demonstration test (TCDT) October 1-2; crew arrival for TCDT tomorrow at 11:30 a.m.; launch remains targeted for the third week of October. The STS 52 crew includes:

Commander James D. Wetherbee; Pilot Michael A. Baker; Mission Specialists William M. Shepherd, Tamara E. Jernigan and Charles Lacy Veach; Payload Specialist is Steven MacLean, who is from Canada. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 29, 1992; Halvorson, FLORIDA TODAY, p. 4A, Sept. 30, 1992.]

II

DISCOVERY: STS 53 PROCESSING

In OPF Bay 3, pressurization of the auxiliary power unit lube oil has been completed. Work in progress: checks on the right hand Orbital Maneuvering System (OMS) pod; body flap closeouts; transport to the VAB of the right forward SRB segment for stacking. The left hand OMS pod is set for installation in Discovery tonight. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 29, 1992.]

II

ENDEAVOUR: SPACELAB J REMOVED FROM PAYLOAD BAY

Now in OPF Bay 1, the STS 47 mission cargo - Spacelab J - has been removed from the payload bay of Endeavour. Preparations are underway to remove residual hypergolic fuels; remove main engine heat shields; deservice the auxiliary power unit water and to conduct post-flight inspections. The right hand OMS pod has been removed from Atlantis and sent to the Hypergolic Maintenance Facility today. Technicians in OPF Bay 2 are troubleshooting the Orbiter's Ku-band antenna. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 29, 1992.]

II

COLUMBIA: PAYLOADS INSTALLED

The LAGEOS II (Laser Geodynamic Satellite) spacecraft was installed into Columbia's payload bay today in preparation for the upcoming STS 52 mission in October. LAGEOS was built by the Italian Space Agency (ASI) and is attached to an IRIS (Italian Research Interim Stage) booster, a low-cost spinning solid upper stage developed by the Italians for deploying moderate sized satellites from the Space Shuttle. USMP-1, the first in the U.S. Microgravity Payload series, was also installed into the payload bay today. The ten-day STS 52 mission will provide the flight duration necessary to achieve the desired microgravity science objective.

The next major activity for each of these payloads is an Interface Verification Test (IVT) which verifies the electrical connections with Columbia and ensures that the payloads will respond correctly when sent commands from the flight deck. The IVT for USMP is scheduled for October 2 and the IVT for LAGEOS/IRIS is scheduled for October 13. Project Management of LAGEOS II is by the Goddard Space Flight Center (Greenbelt, MD). Mission Management of USMP-1 is by the Marshall Space Flight Center (Huntsville, AL). Program Management for both payloads is by the Office of Space Science and Applications (NASA, Washington, D.C.). [NASA/KSC News Release No. 135-92, Sept. 29, 1992.]

II

STS 47 CALLED STEPPINGSTONE

Endeavour's STS 47 Commander Robert L. "Hoot" Gibson called his mission a landmark flight that should serve as a "steppingstone" for NASA's Space Station. "I think it's probably one of those flights that they'll look back on and say that it was a milestone," said Gibson. "It was the 50th [Space Shuttle] mission. We have gone through a lot of growing pains, a lot of learning processes in the course of flying those 50 missions. They haven't all flowed smoothly and they haven't all gone well, but it has been very definitely

a learning process for us and we are still learning. I think one of the biggest landmarks of this flight was our cooperation with the Japanese." Referring to the presence in his crew of husband and wife astronauts Mark C. Lee and N. Jan Davis, Gibson said, "The mission itself was conducted in a very professional way, and that's the entire story of the husband-and-wife couple on the mission," said Gibson. [Halvorson, FLORIDA TODAY, p. 4A, Sept. 30, 1992.]

September 30:

COLUMBIA: ENGINE #3 REMOVED

At Launch Complex 39B the STS 52 payloads have been installed in Columbia and the Orbiter's No. 3 main engine has been removed. Work in progress: interface verification tests of the payloads; preparations to replace main engine number 3; check out of the booster hydraulic system; calibrations of the inertial measurement units; KSC launch readiness review; STS 52 crew arrival at approximately 11:30 a.m. Work scheduled: terminal countdown demonstration test October 1 and 2; flight readiness review October 6. Launch remains targeted for the third week in October. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 30, 1992.]

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DISCOVERY: LEFT OMS POD INSTALLED

During processing activities in OPF Bay 3 the Space Shuttle Discovery has had its left orbital maneuvering system pod installed. Work in progress: electrically connecting the left OMS pod; checkout of the body flap; tests of the waste collection system; tests of the flight control system; purging of the main propulsion helium system. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 30, 1992.]

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ATLANTIS DURING MODIFICATION AT KSC

The right orbital maneuvering system (OMS) pod of Atlantis has been removed and the potable water has been offloaded. Preparations are underway in OPF Bay 2 to install the simulator OMS pods and to conduct auxiliary power unit leak and functional tests. The ferry flight to California remains scheduled to occur on October 17; at Palmdale, CA, the Orbiter will undergo extensive modification of the sort done to Columbia and Discovery earlier. Endeavour, being processed in OPF Bay 1, is undergoing cycling of its external tank doors. Other processing activities: removing the main engine heat shields; post-flight inspections and tests; polishing of its windows and preparations to offload residual hypergolic propellants. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 30, 1992.]

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MILITARY CONSTRUCTION CONTRACT AT KSC

Military Construction Co. (Merritt Island, FL) has been awarded a \$224,377 fixed price contract for the installation of a fire detection system in the Vertical Processing Facility (VPF) at Kennedy Space Center. The VPF is the largest of the Shuttle vertical payload handling facilities at KSC. It features a 10,513-square-foot high bay area and an environmentally controlled "clean room" atmosphere. Although the contract was awarded September 15, 1992, work will not begin until April 1993. Until that time, scheduled Space Shuttle payload processing activities preclude access to the areas where the contract calls for 52 detection sensors to be installed.

The small business firm will provide the sensors, a new fire control panel and other materials, and install them. The ultraviolet/infrared detector sensors will be located in the facility's air lock, high bay and work stands that support the payloads while they are

being assembled and checked out prior to transport to the launch pad and integration into the Orbiter's payload bay. The sensors will be able to detect fire up to a distance of 40 feet, pinpoint its location and relay the information via the control panel to personnel in the VPF and the Complex 39 Launch Control Center for further action. [NASA/KSC News Release No. 134-92, Sept. 30, 1992.]

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STS 52 CREW ARRIVES FOR TCDT

The six-member crew of Columbia's STS 52 mission arrived at Kennedy Space Center today to participate in the **terminal countdown demonstration test and in emergency egress and Shuttle landing practice. Commander James D. Wetherbee spoke for the crew on arrival: "In the next couple of days, we're going to borrow the vehicle for a little bit and get some practice in for ourselves." Launch day is now targeted for October 22. The remaining members of the STS 52 crew are Pilot Michael A. Baker, Mission Specialists William M. Shepherd, Tamara E. Jernigan and Charles Lacy Veatch. The single Payload Specialist for the mission is Steven MacLean, a Canadian astronaut. A firm date will be set following the flight readiness review next week for Columbia's 13th mission. [Halvorson, FLORIDA TODAY, p. 2A, Oct. 1, 1992.]

OCTOBER

October 1:

COLUMBIA: IMUS CALIBRATED

At Launch Complex 39B, technicians have calibrated Columbia's inertial measurement units in preparation for the Orbiter's STS 52 mission later this month. Work in progress: terminal countdown demonstration test began at 8 a.m. at the T-24 hour mark; preparations to replace main engine number 3 if acceptable wind conditions prevail; STS 52 flight crew will perform sharp edge inspection of the payload bay and practice emergency escape procedures at the pad. Work scheduled: conclusion of the terminal countdown demonstration test tomorrow; flight readiness review set for October 6. Launch is currently targeted for October 22. [KSC SHUTTLE STATUS REPORT, 10 a.m., Oct. 1, 1992.]

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DISCOVERY: PAYLOAD BAY CLEANING

Discovery is currently being processed for its STS 53 mission in Orbiter Processing Facility Bay 3. The payload bay is being cleaned and technicians are conducting an interface verification test of the left orbital maneuvering system (OMS) pod; checking out the body flap; testing the communications, waste collection and the flight control systems. [KSC SHUTTLE STATUS REPORT, 10 a.m., Oct. 1, 1992.]

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ATLANTIS: FUEL CELL SIMULATORS INSTALLED

With its ferry flight to California upcoming - October 17 - technicians in OPF Bay 2 have installed fuel cell simulators in the Space Shuttle Atlantis. The Orbiter is undergoing an intensive modification period. Preparations have been made to install the simulator OMS Pods and the left hand fixed radiators. Auxiliary power unit leak and functional tests are ongoing. [KSC SHUTTLE STATUS REPORT, 10 a.m., Oct. 1, 1992.]

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ENDEAVOUR: CHIN PANEL REMOVED

Endeavour's chin panel has been removed following its return from the STS 47 mission. Work in progress: removing the Spacelab-J tunnel adapter and extension; removing the main engine heat shields; post-flight inspections and tests; polishing the windows; preparations to offload residual hypergolic propellants. [KSC SHUTTLE STATUS REPORT, 10 a.m., Oct. 1, 1992.]

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WETHERBEE: 'I'M NOT CONCERNED'

STS 52 Commander James D. Wetherbee said today, "I am not concerned in the least about the need to replace the engine [on Columbia]. They really do a good job down here, and I'm not concerned at all." Wetherbee referred to the changeout of the Orbiter's number 3 main engine which is nearing completion today. Another main engine may need replacement if an x-ray inspection shows the presence of cracks. Meanwhile, the crew is going about usual pre-flight training exercises. "They'll be going through the normal launch-day activities," said KSC spokeswoman Lisa Malone concerning the TCDT going on now at Launch Complex 39B. The practice concludes with a simulated launch at 11 a.m. The crew will return to Houston until October 20 when they arrive for the launch of STS 52 now targeted for October 22. [Halvorson, FLORIDA TODAY, p. 2A, Oct. 2, 1992.]

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YOUNG HONORED FOR 30 YEARS SERVICE

Astronaut John Young was awarded the NASA Outstanding Leadership Medal today by NASA Administrator Daniel S. Goldin in a ceremony at NASA Headquarters (Washington, D.C.). "Today we're here to honor one of NASA's finest and an authentic American hero if there ever was one," Goldin said. "John Young first became an astronaut 30 years ago - September 1962 - back in the days when we were still flying Mercury spacecraft. He had the right stuff back before we even had a name for it. His first flight in space was with Virgil "Gus" Grissom aboard the very first Gemini flight," Goldin continued. "Later he flew with Michael Collins on Gemini 10. In 1969, John made his first trip to the Moon aboard Apollo 10 and returned three years later to become part of the world's most elite fraternity: one of the 12 men to walk on the Moon. For most people, that would have been enough accomplishment for one lifetime. But not John. He waited almost a decade, then became the ultimate test pilot by taking the Space Shuttle for its first flight into space. In 1983, he set a new record as the first man to make 6 flights into space."

Young, 62, currently serves as Special Assistant to the Director of the Johnson Space Center (Houston, TX) for Engineering, Operations and Safety. Prior to this assignment, he was Chief of the Astronaut Office from 1974 to 1987. During this period astronaut crews participated in the Apollo-Soyuz joint American-Russian docking mission, the Space Shuttle Approach and Landing Test program and 25 Space Shuttle flights. In addition to the Outstanding Leadership Medal, Young is the recipient of the Space Congressional Medal of Honor, 3 NASA Distinguished Service Medals and 70 other major awards. He also has been inducted into the National Aviation Hall of Fame. [NASA/KSC News Release No. 92-160, Oct. 1, 1992; "John Young Receives Leadership Medal," FLORIDA TODAY, p. 9E, Oct. 11, 1992.]

October 2:

COLUMBIA: ENGINE #3 REMOVED

Technicians at Launch Complex 39B successfully removed suspect main engine number 3 from Columbia yesterday. High winds had held up the operation until then. The STS 52 flight crew performed sharp edge inspections of the payload bay and practiced emergency egress procedures at the pad yesterday, as well. Work in progress today: the terminal countdown demonstration test was successfully concluded at 11 a.m. at the T-11 second mar; the replacement main engine was connected in place. KSC spokeswoman Lisa Malone said, "It was a good test, although had it been a real launch day, we would have had to hold for the (rainy) weather." The STS 52 crew departed KSC about 2 p.m. for a return to Houston, TX. Work scheduled: interface verification tests between the payloads and the Orbiter planned this weekend; helium signature leak test of the three main engines and main propulsion system on Wednesday (October 7); flight readiness review October 7; launch on October 22. [KSC SHUTTLE STATUS REPORT, 12 p.m., Oct. 2, 1992; Halvorson, FLORIDA TODAY, p. 4A, Oct. 3, 1992.]

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DISCOVERY AND ATLANTIS

Discovery is undergoing tests of its main propulsion system in Orbiter Processing Facility Bay 3. Also underway: interface verification testing of the left orbital maneuvering system (OMS) pod; checkout of the body flap; tests of the waste collection system; final payload bay cleaning. Atlantis, now in a modification phase, will be ferried to Palmdale, CA, for further work on October 17. Meanwhile, work is in progress here: installation of the simulator OMS Pods; tests of the payload bay doors; installation of the roll-around wheels; modifications and inspections; installation of the left-hand fixed radiators.

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ENDEAVOUR: STS 54 PROCESSING

The Spacelab-J tunnel adapter has finally been removed from Endeavour while the Orbiter has been in OPF Bay 1. The tunnel adapter aided access to the payload bay during Endeavour's recently completed STS 47 mission. Work in progress: functional test of the air data system; inspections of the radiators; removal of the main engine heat shields; preparations to offload residual hypergolic propellants. [KSC SHUTTLE STATUS REPORT, 12 p.m., Oct. 2, 1992.]

October 3:

NEW THIRD ENGINE INSTALLED

Columbia had its number 3 main engine replaced today at Launch Complex 39B; technicians are now preparing to test the engine for leaks. The replacement occurred because NASA found a crack in a similar test engine's nozzle and did not want to take chances with Columbia's engine. Replacing the engine was more time efficient than analysis at the pad. A leak test of the entire main engine propulsion system will be conducted on October 7. [Brown, FLORIDA TODAY, p. 1A, Oct. 4, 1992.]

October 4:

FRR LEADS TO FIRM STS 52 DATE

When NASA managers meet October 6 for the STS 52 flight readiness review, one of their objectives is to set a firm date for the launch of Columbia. That date is expected to be October 22. Earlier, Columbia's mission was targeted for the second week of October, but the replacement of a main engine caused pre-flight operations to fall behind. The replaced number 3 engine has now successfully passed a leak test at Launch Complex 39B; the entire propulsion system will be tested for leaks on October 7. [NASA to Set Columbia's Date Tuesday, FLORIDA TODAY, p. 3A, Oct. 5, 1992.]

October 5:

COLUMBIA: IVTS COMPLETED

At Launch Complex 39B, the Space Shuttle Columbia's number three main engine has been replaced and it has undergone several leak tests. Interface verification tests (IVTS) between the payloads the Orbiter have also been conducted. Work in progress: leak tests of the number 3 main engine; making ground connections to the Orbiter in preparation for loading hypergolic propellants into the Orbiter's onboard storage tanks. Work scheduled: helium signature leak test of the three main engines and main propulsion system on October 7. The flight readiness review begins October 6 and launch is targeted for October 22. [KSC SHUTTLE STATUS REPORT, 11 a.m., Oct. 5, 1992.]

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DISCOVERY: THRUSTER REPLACED

A thruster on Discovery's right orbital maneuvering system pod has been replaced during the Orbiter's stay in OPF Bay 1. Work in progress: leak checks of the auxiliary power units; brake anti-skid test; functional test of the landing gear; tests of the main propulsion system and final payload bay cleaning. [KSC SHUTTLE STATUS REPORT, 11 a.m., Oct. 5, 1992.]

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ATLANTIS: INSTALLATIONS COMPLETED

In OPF Bay 2, technicians have completed the installation into Atlantis of the right hand simulator OMS Pod and the left hand fixed radiators. Work in progress: installing the left

hand simulator OMS Pod; leak checks of the main propulsion system; installation of the ferry flight kit items. Extensive modifications of Atlantis will occur in Palmdale, CA, at the Rockwell International plant to which the Orbiter will be ferried October 17. [KSC SHUTTLE STATUS REPORT, 11 a.m., Oct. 5, 1992.]

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ENDEAVOUR: RESIDUAL HYPERGOLICS DRAINED

In OPF Bay 1, technicians have offloaded the residual hypergolic propellants from Endeavour. Work in progress: removing the main engine heat shields; taking samples from the helium tanks; removing windows; functional tests of the forward reaction control system. [KSC SHUTTLE STATUS REPORT, 11 a.m., Oct. 5, 1992.]

October 6:

COLUMBIA STATUS REPORT

The Space Shuttle Columbia has had its number 3 main engine replaced at Launch Complex 39B and initial leak checks have been completed. Also concluded is an Interface Verification Test for the USMP payload with the Orbiter. Currently, the STS 52 flight readiness review is underway in the O & C's Mission Briefing Room. Other work in progress: APU #1 quick disconnect changeout; power-on testing; heat shield installation around the number 3 main engine; preparations for hypergolic propellant loading; preparations for the helium signature leak checks of the main engine and main propulsion system; CVTE payload power supply checkout. Scheduled work on October 7: helium signature leak check; USMP cryogenic servicing; potable water sample. On October 8 and 9 technicians will undertake hypergolic storable propellant loading. On October 10, technicians will conduct the IRIS/LAGEOS payload interface verification test (IVT) with Columbia. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 6, 1992.]

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AUTO-LANDING SCRATCHED

NASA has canceled a test of the Shuttle's automatic landing system planned for Discovery's next mission, STS 53. "We worked hard on it...and you never like to see something stopped that you've started," said astronaut David M. Walker, who is scheduled to command Discovery's upcoming launch. "On the other hand, no pilot that I know of prefers to let a machine land the vehicle instead of himself." He said the decision suits him fine. "I'm personally a lot happier just to be able to land (the Shuttle) myself rather than have to watch the machine do it and be prepared to take over if it didn't do it correctly." The rest of the five-person crew includes: Pilot Robert D. Cabana and Mission Specialists Guion S. Bluford, James S. Voss and Michael R. U. Clifford. [Halvorson, FLORIDA TODAY, p. 5A, Oct. 7, 1992.]

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STS 52: OCTOBER 22 LAUNCH DATE TARGET

NASA managers today announced October 22 as the official launch date for the next Space Shuttle mission. KSC spokeswoman Lisa Malone said at the conclusion of the Flight Readiness Review that "there were no major issues that were identified that would prevent us from launching on Oct. 22." The STS 52 flight will see the Space Shuttle Columbia and her 6 person crew deploy a satellite developed by the United States and Italy to obtain precise measurements of the Earth's tectonic plates. A series of U.S./Canadian experiments also will be conducted during the mission. The launch window on October 22 opens at 11:16 a.m. EDT and extends for 2 and 1/2 hours. The mission duration for STS 52 is 9 days, 20 hours, 46 minutes. At the end of the mission

Columbia is scheduled to land at Kennedy Space Center's Shuttle Landing Facility in Florida. Mission Commander is James D. Wetherbee with Michael A. Baker serving as Pilot. Mission Specialists are Charles Lacy Veach, William M. Shepherd and Tamara E. Jernigan. Stephen Maclean is the payload specialist and the third Canadian to fly aboard the Space Shuttle. ["NASA Sets Date for STS 52 Space Shuttle Launch," Oct. 6, 1992; Halvorson, FLORIDA TODAY, p. 5A, Oct. 7, 1992; NASA/KSC News Release No. 92-88, Oct. 6, 1992.]

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SPACE STATION GRANTS AWARDED

NASA has awarded approximately \$15 billion in annual funding for 124 microgravity research grants to develop the research potential of Space Station Freedom as one of the nation's premiere science and technology assets. "These awards are a major step towards the Space Station Era of microgravity research," said Robert Rhone, Director of NASA's Microgravity Science and Applications Division, at agency headquarters in Washington, D. C. "The hardware and experiments developed from these grants could make Space Station Freedom a microgravity laboratory unrivaled by any other." The grants to the 119 researchers represent an increase of 70 percent in the number of investigators sponsored by the microgravity division. The division now sponsors nearly 200 scientific investigators and plans to expand to at least 300 before Space Station Freedom is operational in 1997. The selected investigators represent 60 universities, eight corporate or private laboratories, five government laboratories and four NASA centers. Nearly 500 proposals were submitted by scientists in response to the NASA research announcements in fluid dynamics, biotechnology, materials science and fundamental science. The proposals were evaluated by peer review panels of recognized experts in those areas. [NASA/KSC News Release No. 92-167, Oct. 6, 1992; Halvorson, FLORIDA TODAY, p. 9E, Oct. 11, 1992.]

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RUSSIA/NASA SIGN AGREEMENTS

NASA and the Russian Space Agency (RSA) have signed two cooperative agreements in Moscow, in the areas of human space flight and Mars exploration. "Signing these two agreements is the next crucial step in expanding cooperative space activities with our Russian partners. We are very anxious to begin working on these important programs," said NASA Administrator Daniel S. Goldin. The Human Space Flight Agreement outlines the flight details of a Russian cosmonaut on the U.S. Space Shuttle, the flight of a U.S. astronaut on the Russian Mir Space Station and a joint mission including the rendezvous and docking of the Space Shuttle with the Mir Space Station.

The Mars '94 agreement is for the flight of two U.S./NASA scientific instruments on the Russian Mars '94 lander. The agreements were signed by Administrator Goldin and RSA Director Yuri Koptev during the first annual U.S./Russian Space Policy Consultations. Ambassador Frank Wisner, Under Secretary of State, headed the U.S. delegation and met with Russian Ministry of Foreign Affairs officials to review the U.S./Russian space relationship.

Human Space Flight Cooperation Agreement

An experienced cosmonaut will fly aboard the STS 60 Space Shuttle mission, scheduled for launch in November 1993. RSA has nominated Col. Vladimir G. Titov and Sergei K. Krikalev as the two cosmonauts who will undergo mission specialist training. One cosmonaut will be designated the prime crewmember and the other designated backup

crewmember. The cosmonauts are scheduled for arrival at NASA's Johnson Space Center (Houston, TX) in October 1992. A NASA astronaut will fly on a long-duration (more than 90 days) Mir Space Station flight. The flight's timing will coincide with a Shuttle docking flight in 1995. The astronaut will be flown to the Mir on a Soyuz spacecraft. The astronaut's duties will focus on science, particularly life sciences, as well as engineering and operational objectives.

Two NASA astronauts will receive full cosmonaut training with their cosmonaut crewmates at the Yuri Gagarin Cosmonaut Training Facility "Star City" near Moscow. They will begin training no later than 12 months prior to the agreed flight date. One astronaut will be selected as the prime crewmember and the other will be designated backup crewmember. NASA will transport two cosmonauts in the Space Shuttle to replace the two cosmonauts on board Mir. Life sciences experiments, involving the NASA astronaut and the two cosmonauts on board the Mir, will be conducted while the Shuttle and the Mir are docked. The NASA astronaut and the two cosmonauts who have been docked on the Mir will be returned in the Shuttle to the United States for continued post-flight life sciences experiments.

NASA Participation in the Russian Mars '94 Mission

The primary objective of this mission is to carry out further joint exploration of planet Mars in conjunction with the Russian Mars '94 mission. This may provide the opportunity for U.S. scientific instruments to be carried aboard the Russian spacecraft. This cooperation could significantly enhance the present Mars '94 mission and provide critical data for future human and robotic Mars missions. One U.S. instrument is the Soil Magnetic Properties Experiment, and the other is the Soil Reactivity/Composition Experiment. These will enable scientists to characterize the Martian physical and chemical surface environment. The soil magnetic properties experiment will use a magnet to collect and measure the magnetic minerals in the Martian soil. The soil reaction/composition experiment will provide chemical information about the volatile components in the Martian soil. [NASA/KSC News Release No. 92-165, Oct. 6, 1992.]

October 7:

STS 52: COLUMBIA STATUS

At Launch Complex 39B, workers have completed: APU #1 quick disconnect changeout; galley water tank changeout; Space Shuttle main engine number 3 changeout and leak checks; USMP payload interface verification test with Columbia. Work in progress: power-on testing; heat shield and eye lid installation around SSME #3; preparations for hypergolic propellant loading; helium signature leak checks of the main engines and main propulsion system; USMP payload cryogenic servicing; CVTE payload power supply checkout; potable water sampling. Work scheduled: hypergolic storable propellant loading on October 8 and 9; IRIS/LAGEOS payload interface verification test with Columbia on October 10; flight readiness test on October 11. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 7, 1992.]

October 8:

PROPELLANT LOADING TODAY

Loading of hypergolic propellants into the Space Shuttle Columbia begins today. George Diller, KSC spokesman, said, "Everything is pretty much just clicking along." The loading will begin about noon and continue until early this next morning. Prior to loading the helium signature leak test will be conducted to insure that no leaks exist. [Halvorson,

FLORIDA TODAY, p. 6A, Oct. 8, 1992; "Workers to Fill Shuttle's Fuel Tanks," FLORIDA TODAY, p. 5A, Oct. 10, 1992.]

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HELIUM TEST ON COLUMBIA GOES SLOWLY

The helium signature leak test of Columbia's main engines went smoothly, according to KSC spokesperson George Diller who said, "Everything is just trucking along." The test did proceed more slowly than expected and that caused managers to delay loading propellants until tomorrow [October 9]. [Halvorsen, FLORIDA TODAY, p. 6A, Oct. 9, 1992.]

October 9:

COLUMBIA STATUS REPORT: STS 52

At Launch Complex 39B, technicians have completed a helium signature leak check of Columbia's main engines and main propulsion system. Other pre-launch work completed includes: payload bay door closure for hypergolic loading activities; APU #1 quick disconnect changeout; galley water tank changeout; main engine number 3 changeout and leak checks; main engine number 3 heat shield and eye lid installation; USMP payload interface verification test and cryogenic servicing and potable water sampling. In progress is oxidizer loading which requires the clearing of LC 39B of all but essential personnel. Scheduled work: fuel loading Saturday (October 10); reopen payload bay doors Saturday night; gaseous oxygen system leak check; IRIS/LAGEOS payload interface verification test with Columbia on Sunday (October 11); flight readiness test (FRT) on Sunday night; aft main engine compartment closeouts begin October 12; ordnance installation and hypergolic pressurization on Monday night; EMU (Extravehicular Mobility Unit) installation on Wednesday (October 14); external tank purges on Thursday (October 15); USMP payload cryogenic toff/close payload bay doors on Tuesday (October 19). Launch is set for October 22 at 11:16 a.m. EDT and landing is planned for Kennedy Space Center at 7:02 a.m. EDT, Sunday (November 1). [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 9, 1992; Brown, FLORIDA TODAY, p. 1A, Oct. 11, 1992.]

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DISCOVERY: STS 53 STATUS REPORT

In the Vehicle Assembly Building, technicians have completed stacking the solid rocket boosters for Discovery's upcoming STS 53 mission planned for the third week of November with a planned KSC landing six days later. Hydrogen and Oxygen have been delivered for the mission to Launch Complex 39A storage spheres. Discovery is still in OPF Bay 3 where workers have completed ammonia, water spray boiler and potable water servicing; potable water loop leak checks are also finished. Work in progress: auxiliary power unit checks; left OMS pad installation; test cycle of the right payload bay door; preparations in the VAB for ET/SRB mating on Tuesday (October 13); solid rocket booster joint closeouts in the VAB. Work scheduled: preparations for the APU thruster changeout on Sunday (October 11); hydraulic system testing; OMS electrical redundancy testing; OMS Pod leak checks; load mass memory units; aft structural leak checks; Orbiter positive pressure checks; position flight control surfaces for rollover to VAB; rollover to VAB and mate to ET/SRB stack on October 20. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 9, 1992.]

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ATLANTIS: POWER DOWN COMPLETED

In OPF Bay 2, Atlantis has been powered down and its payload bay doors were closed Thursday (October 8) night. Work in progress: closeouts for the Orbiter's ferry flight to California for modifications; auxiliary power unit tank removal in preparation for that flight; installation and configuration of ferry flight pods. Work scheduled: ferry flight tail cone installation on October 13; beginning installation on Orbiter transporter on October 15; move to mate/demate device and mate to the 747 Shuttle Carrier Aircraft on October 16. The mated pair will depart Kennedy Space Center on Saturday morning, October 17. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 9, 1992.]

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ENDEAVOUR: POST STS 47 WORK

Endeavour has undergone post STS 47 inspections in OPF Bay 1: Technicians have completed a forward reaction control system functional test and replacement of the payload bay floodlights. A Tracking and Data Relay Satellite mating to its IUS is complete in the VPF (Vertical Processing Facility). TDRS state-of-health checks are completed. Work in progress: drag chute installation; TACAN #2 retest; crew hatch functional check; installation of crew sleep restraints; landing gear deployment; orbital maneuvering system functional test; window inspections; main engine leak checks; external tank installation into test cell in the Vehicle Assembly Building; TDRS White Sands compatibility testing in the VPF. STS 54 work scheduled: installation of wheels and tires; OMS Pod functional testing; APU 1/3 hot lube oil flush; window polishing. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 9, 1992.]

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PIONEER VENUS' CAREER ENDED

The Pioneer Venus spacecraft, which had been orbiting Venus since 1978, did not survive its passage through Venus' upper atmosphere at 3:22 p.m. EDT October 8. The spacecraft passed throughout the lowest part of its orbit, which repeated every 24 hours, at 3:22 p.m. EDT. During this period, the radio signal could not be tracked from Earth because Pioneer was hidden behind Venus. No radio signal could be detected from the spacecraft when it should have emerged from behind the planet. Project officials believe the spacecraft was disabled by the heat of friction with Venus' atmosphere, with spacecraft insulation and other fragile components melting or breaking off. Although the spacecraft's remains will continue to orbit Venus for a short while, no further data can be collected without the radio signal. Pioneer Venus made the first maps of Venus and has returned thousands of pictures of the planet over the past 14 years. [NASA/KSC News Release Number: N92-89, Oct. 9, 1992.]

October 12:

DELTA LAUNCH SUCCESSFUL

At 5:47 a.m. EDT this morning, McDonnell Douglas Space Systems Co. successfully launched its Delta 2 rocket from Cape Canaveral Air Force Station. "I think [the launch] demonstrates the competitiveness of the U.S. industry and the ability of the U.S. launch companies to compete internationally," said Chuck Kline, Associate Director for Program Affairs, Office of Commercial Space Transportation in the Department of Transportation. Aboard the rocket is a German communications satellite called Kopernikus, named for the 16th century astronomer. ["Delta Rocket to Lift Off," FLORIDA TODAY, p. 1A, Oct. 12, 1992; Photograph of Launch, FLORIDA TODAY, p. 1A, Oct. 13, 1992; Halvorson, FLORIDA TODAY, p. 4A, Oct. 13, 1992; Brown, FLORIDA TODAY, p. 1A, Oct. 11, 1992.]

October 13:

ORDNANCE INSTALLATION FOR COLUMBIA

Technicians are ready today to install ordnance devices aboard the Space Shuttle in preparation for its launch on October 22. The explosives separate Columbia from Launch Complex 39B for liftoff and the Orbiter from its solid rocket boosters and the external tank after the propellants have been loaded, according to George Diller, KSC spokesman. The interface verification test between the Orbiter and its payloads was completed successfully over the weekend, as well. Other completed work includes: RMS elbow camera failed; flight readiness test of main engines and flight control surfaces have been completed; thermal protection system closeouts. Hypergolic tank pressurization is in progress. Work scheduled: aft main engine compartment closeouts; contingency EVA spacesuit installation; firepole installation; installation of flight crew equipment; ET purges; ordnance connections; filling of LC 39B cryogenic storage spheres; USMP payload cryogenic servicing; payload bay closeouts; validation of the pad's Firex system; pad/mobile launcher platform washdown. [Halvorson, FLORIDA TODAY, p. 4A, Oct. 13, 1992; SPA, SHUTTLE STATUS REPORT: STS 52, Oct. 13, 1992; Banke, FLORIDA TODAY, p. 1, Oct. 14, 1992.]

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ATLANTIS STATUS

In Orbiter Processing Facility Bay 2, installation of the ferry flight tailcone is in work on the Orbiter Atlantis. OV-104 (Atlantis) will be placed on the Orbiter transporter on Thursday (October 15) and moved to the mate-demate device at the Shuttle Landing Facility on Friday (October 16); departure for Palmdale (CA) is at sunrise on Saturday morning (October 17). [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 13, 1992.]

October 14:

COLUMBIA: LAUNCH MINUS 8 DAYS

At Launch Complex 39B, the Space Shuttle is eight days away from liftoff, set for 11:16 a.m. EDT, October 22. Workers have completed: initial ordnance installation; hypergolic tank pressurization; IRIS/LAGEOS Interface Verification Test (IVT) with Columbia; Flight Readiness Test of the vehicle's main engines and flight control surfaces. Work in progress: contingency EVA (Extravehicular Activity) spacesuit installation; Orbiter/External Tank cavity purge leak checks; IRIS/LAGEOS changeouts; auxiliary power unit leak checks; main engine number 3 gimbal check; carrier panel/heat shield installation; PRSD tank purges; countdown preparations and communication activation in FR (Firing Room) #3.

Work scheduled for October 15: aft main engine compartment cleaning/closeouts; firepole installation; ET purges; begin flight crew equipment stowage in crew cabin; Orbiter aft confidence test; auxiliary power unit closeout inspections. Work scheduled for October 16: cavity purge retest. Work scheduled for October 17: ordnance connections. Work scheduled for October 18: Orbiter aft positive pressure check; install Orbiter aft flight doors. Work scheduled for October 19: USMP payload cryogenic servicing; payload bay closeouts; pad/mobile launcher platform washdown/debris walkdown; begin STS 52 countdown at 4 p.m. The payload doors will be closed on October 20. In OPF Bay 2, installation of the ferry flight tailcone is complete on the Orbiter Atlantis. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 14, 1992; Banke, FLORIDA TODAY, p. 6A, Oct. 15, 1992.]

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ATLANTIS FERRY FLIGHT

The Space Shuttle Atlantis will begin its cross-country ferry flight to the Rockwell International plant in Palmdale, CA, early Saturday morning (October 17) for a year-long series of structural inspections and modifications. Atlantis is scheduled to leave KSC atop the 747 Shuttle Carrier Aircraft at 7:30 a.m. on the 17th. Tomorrow morning, Atlantis will be towed from OPF Bay 2 to the mate-demate device located on the ramp at the Shuttle Landing Facility. The Shuttle Carrier Aircraft is expected to arrive at Kennedy Space Center early tomorrow morning. It will then be mated to NASA 911, the SCA, which will carry the Shuttle to California. [NASA/KSC News Release No. 142-92, Oct. 14, 1992; Banke, FLORIDA TODAY, p. 6A, Oct. 15, 1992.]

October 15:

COLUMBIA: PRE-LAUNCH STATUS REPORT

With seven days remaining before the liftoff of STS 52, Columbia has had a number of pre-launch tasks completed while it sits upon Launch Complex 39B. Finished work: contingency EVA spacesuit installation; Orbiter/external tank cavity purge leak checks; IRIS/LAGEOS closeouts; auxiliary power unit leak checks; main engine #3 gimbal check; carrier panel/heat shield installation; PRSD tank purges; countdown preparations and communications activation in FR #3. Work in progress: aft main engine compartment cleaning and closeout; Orbiter aft confidence test; stowage of consumables and flight crew equipment in crew cabin; firepole installation on the mid-deck; external tank purges; auxiliary power unit closeout inspections.

Scheduled work includes: cavity purge retest; loading of mass memory units; vehicle ordnance connections; IRIS/LAGEOS ordnance connections; external tank/solid rocket booster closeouts; Orbiter aft positive pressure check; removal of main engine protective covers; aft compartment final inspections; installation of Orbiter aft flight doors; USMP payload cryogenic topoff; payload bay closeouts; pad/mobile launcher platform washdown/debris walkdown; STS 52 countdown begins October 19; the payload bay doors are closed October 20. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 15, 1992.]

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DISCOVERY: SIGNAL CONDITIONER FAILS

Testing indicates a power bus within a signal conditioner has failed on Discovery's left OMS Pod. There are two busses within each signal conditioner, and there are two signal conditioners on each pod. While the signal conditioner does not affect performance of the pod, it provides half of the instrumentation data available from the pod. Should the second power bus which does work fail in flight, half of the instrumentation on the pod could not be monitored, leaving flight controllers without data. The signal conditioner cannot be replaced while the pod is on the Orbiter. A final test confirming the failure is planned before a decision is made to remove the pod. However, should this course of action be adopted, a schedule impact of more than a few days is possible. Whether to replace the pod with another, or whether to remove the pod and replace the signal conditioner at the Orbiter Processing Facility, and the schedule impact of each, is under discussion should the failure be confirmed. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 15, 1992; NASA/KSC News Release No. 92-055, Oct. 14, 1992; Banke, FLORIDA TODAY, p. 2A, Oct. 16, 1992.]

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NASA/CONTRACTORS CONFERENCE

The Ninth Annual NASA/Contractors Conference on Quality and Productivity will take place at the Pasadena Center (Pasadena, CA), October 20-21, 1992. The theme of this year's conference is "World Class Excellence: The Journey Continues." The event is expected to draw over 900 attendees. The conference, hosted by the Jet Propulsion Laboratory in conjunction with the California Institute of Technology, both in Pasadena, will provide a forum to discuss and exchange ideas, success stories and lessons learned in the practical application of the principles of Total Quality Management that spearhead continuous improvement within organizational structures and processes.

NASA Headquarters Associate Administrator for Continuous Improvement Dr. Laura Broedling will give the opening keynote address. A highlight of the event will occur when Acting Deputy Administrator Aaron Cohen announces the 1992 George M. Low Trophy recipient(s), NASA's Quality and Excellence Award, at the evening banquet on October 20.

1992 Low Trophy Finalists

Cray Research, Customer Service, Engineering and Manufacturing Divisions	Chippewa Falls, Wisconsin
Honeywell, Inc., Space and Strategic Systems Operation	Clearwater, Florida
IBM Federal Systems, Co.	Houston, Texas
McDonnell Douglas Space Systems Co.	Kennedy Space Center, Florida
Paramax Systems Co.	Houston, Texas
Rocket Research, Co.	Redmond, Washington (Small Business)
Stanford Telecommunications, Inc.	Reston, Virginia
Technical Analysis, Inc.	Houston, Texas (Small Business)

The award recognizes both NASA's large and small prime contractors, subcontractors and suppliers for outstanding achievement in quality and productivity improvement and Total Quality Management (TQM). Key goals of the award are to internalize quality and productivity practices and TQM processes throughout NASA and the agency's contractors and to transfer performance improvement methods of the award recipients to others. [NASA/KSC News Release Number 92-90, Oct. 15, 1992.]

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GOLDIN ANNOUNCES NASA CHANGES

"Of all the agencies in government, NASA has a unique responsibility to invest in the future to ensure there is hope and opportunity, to keep America on the cutting edge of technology," NASA Administrator Daniel S. Goldin said in Washington. "Today, I am announcing a series of structural changes to better focus NASA's programs, to streamline how we do business so we can meet the challenges ahead." In preparation for today's announcement, Goldin said over the past six months he has traveled to NASA's centers, visiting with hundreds of employees, worked with the Red & Blue Teams, met with CEO's

of America's top companies, met with small and disadvantaged companies, small entrepreneurial companies, and reached out into minority and women-owned companies. He has also traveled abroad to meet with leaders in space policy, met personally with almost 200 members of Congress and analyzed major reports such as the Augustine Report, the Paine Commission Report, and the Rogers Commission Report. He has also reached out to academia and the science community.

"The past six months I've reached deep into NASA to listen to the hopes and dreams of employees. I've listened to concerns expressed by America's leaders outside the agency," he said. "If there is universal agreement on one point it's that NASA cannot afford to fail, that it must be the preeminent technological leader of the world," Goldin stated. "NASA must reach for the stars and bring back to America dual-use technology to improve life on Earth." To achieve its goals, Goldin announced the following structural and managerial changes at NASA:

SPACE STATION FREEDOM: Strengthening the focus of management of Space Station Freedom (SSF) is of the highest priority to NASA. In a September 17, 1992, speech, Goldin said he was "taking steps to ensure NASA's top talent is working on this program." **Marty Kress** will become Deputy Program Manager for Policy and Management, responsible for strengthening cooperation with the space station user community, international partners, and the private sector. Kress's previous position was Assistant Administrator for Legislative Affairs. "Marty Kress is one of NASA's best and brightest young 'stars,' who has successfully helped me steer the agency through difficult budget deliberations on Capitol Hill," Goldin said. "His talent is now needed for even greater challenges, to pull together, coordinate, and integrate the scientific and commercial communities so they take full advantage of the opportunities [offered by] Space Station Freedom." Marty Kress' appointment will allow **Richard Kohrs** to focus his skills on the day-to-day development and construction of SSF. **Mary Kerwin**, Director, Liaison Division, will become Acting Assistant Administrator for Legislative Affairs. **Tom Campbell**, formerly Comptroller, will become the Chief Financial Officer for SSF to help ensure SSF keeps within its budget estimates. "Tom Campbell is recognized as the strongest financial officer at the agency," Goldin said. "He's NASA's top talent, who will be responsible for keeping a watchful eye on the budget and schedule." **Gary Allison**, who was Deputy Comptroller, will become Acting Comptroller.

SCIENCE & TECHNOLOGY: NASA, which is known for its science, must strengthen its outreach to the science community to improve the integration and coordination of research. **Lennard A. Fisk** will be promoted to the new position of Chief Scientist for NASA. Len's previous position was Associate Administrator for Space Science and Applications. "Len is one of NASA's most brilliant and outstanding scientists," Goldin said. "His formidable challenge will be to aggressively work with the scientific and engineering community to fully involve them in our research goals. He will be responsible for forging a strong bond with the directors of research and development in corporate America to ensure NASA is getting the very best technology in all our science missions," Goldin said. "Len, because of his outstanding communication abilities, will also be instrumental in explaining to the public the importance of NASA's research to improve life on Earth and inspire opportunity and hope," Goldin continued.

EARTH & PLANETARY SCIENCE: The office of Science and Space Applications will be divided into two parts to bring focus to the programs. **Shelby Tillford**, will become Acting Associate Administrator of Mission to Planet Earth. He previously was Director of Earth Sciences. "Mission to Planet Earth is more than a duty, it's a moral commitment to future

generations," Goldin said. "We must understand our environment - separating natural from human causes and effects - so policy makers can make decisions on hard data, not suppositions." Wes Huntress, previously Director of Solar Systems Exploration, will become Acting Associate Administrator of Planetary Science and Astrophysics. "We must build more spacecraft that are smaller, faster, and cheaper," Goldin said. "By studying our solar system and the universe, we will be able to better understand Earth's environment and its future, and see if life developed other places."

AERONAUTICS: Goldin announced in a recent speech that NASA needs a better balance of programs between subsonics, NASP hypersonics, and high speed civil transport. In addition, NASA needs to develop a strategic plan to ensure we have the proper facilities to keep America's aerospace industry the world's leader. The Office of Aerospace and Space Technology will be divided to provide focus. Pete Peterson will become Special Assistant to the Administrator to develop a comprehensive and integrated long-term plan that identifies the critical facilities for aeronautics and space. He had been an Associate Administrator. "As the Augustine Report points out, NASA's infrastructure is critical to meeting its mission goals," Goldin said.

"NASA must develop an integrated facilities plan, in coordination with other government agencies and private industry, to construct world class facilities for aeronautics and space. We must avoid duplication in government and industry to achieve maximum results and stretch taxpayer's dollars," he said. Cecil Rosen, who was Director for Aeronautics, will become Acting Associate Administrator for the Office of Aeronautics. Gregory Reck will become Acting Associate Administrator for the new office of Advanced Concepts & Technology. Courtney Stadd will become Acting Deputy Associate Administrator for the new office of Advanced Concepts & Technology. "NASA needs to attract and work with America's greatest researchers and entrepreneurs in academia and industry," Goldin said. "This office will push America's technological frontiers. It will be the catalyst for innovation and commercialization of technology, for transferring technology to create jobs and opportunity." As part of the restructuring, the Office of Commercial Programs will become part of this new division. Jack Mannix, who was Assistant Administrator for the Office of Commercial Programs, will become Associate General Counsel for Intellectual Property.

RUSSIAN PROGRAMS: Samuel Keller, Associate Administrator for Russian Programs will be on Special Assignment. "Because of Sam Keller's talent and hard work, NASA has been able to sign far-reaching contracts with Russia in record speed," Goldin said. "He now will be moving on to new and exciting challenges." [NASA/KSC News Release No. 92-172, Oct. 15, 1992; "Goldin Revamps NASA Management," FLORIDA TODAY, p. 9E, Oct. 25, 1992.]

October 16:

COLUMBIA: PRE-LAUNCH STATUS

Technicians at Launch Complex 39B have completed an Orbiter aft confidence test and the stowage of consumables and flight crew equipment in the crew cabin of Columbia. The firepole has been installed in the mid-deck; the external tank has been purged; auxiliary power unit closeout inspections have been conducted and the contingency EVA spacesuit has been installed. Still in progress for the Shuttle's STS 52 mission: aft main engine compartment closeouts; loading of mass memory units; cavity purge retest; ordnance installation; preparations to pick up the countdown at 4 p.m. Monday (October 19). Work scheduled: vehicle ordnance connections; IRIS/LAGEOS ordnance connections; USMP cryogenic servicing; external tank/solid rocket booster closeouts; aft

compartment final inspections; installation of aft flight doors; Orbiter aft pressure check; USMP cryogenic toff; payload bay closeouts; astronaut arrival; closing of payload bay doors on October 20; gaseous oxygen system leak check. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 16, 1992.]

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DISCOVERY: STS 53 PREPARATIONS

Discovery's solid rocket boosters have been completely stacked for mating in the Vehicle Assembly Building; the external tank and SRBs have been mated and technicians have conducted an IUS/TDRS interface verification test. STS 53 mission preparations in progress include: vibration testing; nose wheel steering test; auxiliary power unit closeouts; left OMS Pod electrical troubleshooting; IUS/TDRS end-to-end communications test in the Vertical Processing Facility; aft section closeouts. Work scheduled: disconnect left hand orbital maneuvering system pod crossfeed lines; remove and inspect left hand OMS Pod; replace left hand OMS Pod. A decision has not yet been made on whether to repair and use the pod now on Discovery or to use another pod now at the Hypergolic Maintenance Facility. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 16, 1992; "Spacecraft Passes Tests," FLORIDA TODAY, p. 10E, Oct. 25, 1992.]

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ATLANTIS: GETTING OUT OF TOWN

The Space Shuttle Atlantis continued in a pre-ferry flight mode at Kennedy Space Center today. The Orbiter was mounted on the Shuttle Carrier Aircraft and moved to the Shuttle Landing Facility. The mated pair were set to head for Palmdale, CA, tomorrow, barring poor weather. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 16, 1992.]

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ENDEAVOUR: STS 54 PROCESSING

Endeavour, also known as OV-105, remains in Orbiter Processing Facility Bay 1 where it is being processed in anticipation of a January 1993 STS 54 launch. Work completed to date: drag chute installation; drag chute mortar installation; crew hatch functional check; OMS functional test; main engine leak checks; power reactant storage and distribution system checks; waste management system drain and flush. Work in progress: auxiliary power unit servicing; reactant system checkout; inspections of the 17 inch quick disconnect; main propulsion system leak checks; nose wheel steering checkout; brake hydraulic system testing; left booster stacking in the VAB; external tank electrical testing in the VAB; window replacement/window polishing. Installation of the support beam for Get Away Special canisters has been scheduled. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 16, 1992.]

October 19:

STS 52: COUNTDOWN STARTS TODAY

The countdown for Columbia's 13th mission starts today at 4:00 p.m. EDT. "So far it's been a pretty quiet, smooth operation," said George Diller, KSC spokesman. "Unless we get some kind of surprise, this is going to follow just the way we've laid it out." Liftoff is set to occur between 11:16 a.m. and 1:46 p.m. EDT. Technicians are trying to finish their last tasks inside Columbia so the payload bay doors can be closed Tuesday morning. Atlantis finally began its cross-country ferry flight yesterday after bad weather prevented the takeoff of the Orbiter and its Shuttle Carrier Aircraft on Saturday. The Shuttle will remain in California for almost a year until it returns to the space center for its April 1994

launch. [Banke, FLORIDA TODAY, p. 1A, Oct. 19, 1992; Banke, FLORIDA TODAY, p. 1A, Oct. 18, 1992.]

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COLUMBIA: STS 52 STATUS REPORT

Ordnance connections have been made for the IRIS/LAGEOS payloads aboard Columbia for its STS 52 mission. The external tank and solid rocket boosters have been closed out. Work in progress: payload closeouts; USMP cryogenic toff; removal of IRIS/LAGEOS safe and arm pin; aft main engine compartment closeouts; cabin stowage; countdown preparations in Firing Room #3; pad/mobile launcher platform washdown/debris walkdown. Work scheduled: aft access platform removal; installation of aft flight doors; Orbiter aft pressure check; removal of payload access; closing of payload bay doors at 5:30 a.m. October 20; start of countdown at 4 p.m.; astronaut arrival at 5:30 p.m.; installation of mid-deck experiments; retraction of rotating service structure; tanking. The chance of acceptable liftoff weather on October 22 is 80%. Skies are forecast to be partly cloudy, the temperature approximately 80 degrees, and winds are expected to be NNE 10-15 knots. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 19, 1992.]

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ASTRONAUTS ARRIVE AT KSC

The six astronauts of Columbia's STS 52 mission crew arrived today at Kennedy Space Center about 5:30 p.m. "Columbia's ready to go. All of our experiments are ready to go, and our training team says that we are ready to go. I can absolutely, positively guarantee that we are ready to go fly and take one more small step in this great adventure," said Mission Specialist Charles Lacy Veach on his arrival at the Shuttle Landing Facility this afternoon. Forecasters continue to predict an 80% chance of favorable weather for the launch window which extends from 11:16 a.m. until 1:46 p.m. October 22. Commander James D. Wetherbee remarked at the arrival ceremony: "We have a pretty challenging mission ahead of us. We're looking forward to it. We have a lot of science that we're going to try to accomplish and hopefully we'll bring a lot of data back and keep the scientists happy for a couple of years. We may end up with more questions than answers but that's the nature of the game." Mission Specialist Tamara E. Jernigan commented, "We're ready to go. We're ready to light 'em." The other members of the crew are Pilot Michael A. Baker and Mission Specialists William M. Shepherd and Canadian space rookie Steven MacLean. [Brown, FLORIDA TODAY, p. 4A, Oct. 20, 1992.]

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LAUNCH CLOSES PLAYALINDA BEACH

Playalinda Beach will be reopened to visitors the day following the launch of the Space Shuttle Columbia from Launch Complex 39B on Mission STS 52. Launch is scheduled for 11:16 a.m. EDT, October 22. The beach closing is required whenever a Space Shuttle is present at LC 39B or three days prior to a launch from LC 39A. [NASA/KSC News Release No. 147-92, Oct. 19, 1992.]

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IML-2 MISSION SPECIALISTS SELECTED

NASA today announced that Dr. Chiaki Mukai, Ph.D and M.D. of the Japanese National Space Development Agency, has been designated as the prime payload specialist for the second International Microgravity Laboratory mission (IML-2) scheduled for launch in July 1994. Dr. Jean-Jacques Favier, a scientist with the French Atomic Energy Commission, has been selected as an alternate payload specialist. During the mission, Dr. Favier will

be one of the principal communicators with the laboratory. As a backup payload specialist, he also will train for the payload mission so that he could substitute for a flight payload member should one be unable to fly the mission. Dr. Favier was selected by the French Space Agency as a candidate astronaut in 1985.

"The selection of Dr. Mukai and Dr. Favier to the crew of the IML-2 mission truly accents the international nature of the mission," said NASA Administrator Daniel S. Goldin. "I was pleased to have the honor of informing both the Japanese and the French space agencies of their selection." The first mission in the series, IML-1, flew in January 1992 on the STS 42 flight of Columbia. For IML-2, an international team consisting of 80 principal investigators from more than 13 countries will focus on materials and life sciences, two disciplines needing crew participation and access to reduced gravity. IML-2 will use the Spacelab long module and is a dedicated microgravity mission. The overall objective of the IML-2 mission is to conduct investigations in applications, science and technology that require the low-gravity environment of Earth orbit flight and a stable vehicle attitude over an extended-duration mission.

The mission plan calls for the Space Shuttle Columbia to fly in a 160 nautical mile-high, 28.5 degree orbit. Mission duration is planned for 13 days. The Orbiter will fly in a "gravity gradient" stabilized attitude (tail toward Earth), thereby producing the least gravitational disturbances on the Spacelab laboratory during the flight. As previously announced, NASA astronaut Richard J. Hieb will serve as Payload Commander and Mission Specialist for IML-2. Other crew members will be named in the future. The IML series is intended as an ongoing international research program in materials and life sciences in a microgravity environment. The program is managed by NASA's Office of Space Science and Applications, Washington, D.C. Wayne Richie is the IML-2 Program Manager, and Dr. Robert Sokolowski, NASA Headquarters, is the Program Scientist. The IML-2 Mission Manager is Lanny Upton, and the Mission Scientist is Dr. Robert Snyder, both from the Marshall Space Flight Center (Huntsville, AL). [NASA/KSC News Release, Oct. 19, 1992.]

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TDRS-F/IUS-13 COMPLETES KEY TESTS

The Tracking and Data Relay Satellite (TDRS-F), scheduled to be launched on Shuttle mission STS 54, completed two significant tests last week while in the Vertical Processing Facility at Kennedy Space Center. On October 14-15, the spacecraft, the sixth of its kind to be launched aboard the Shuttle, successfully completed an interface verification test (IVT) between the satellite and the inertial upper stage (IUS) booster. The IVT, a 30-hour-long systems test, revealed no problems with the electrical or mechanical connections between the TDRS and the IUS. The test also confirmed the ability of the two components to communicate with each other and with the Space Shuttle vehicle. The TDRS was mated to the IUS on October 5.

Following the IVT, Roelof Schilling, the TDRS Payload Manager, said, "we are continuing on schedule and found nothing that will cause us to deviate from our current timeline." Also last week, the spacecraft successfully passed the all encompassing "end-to-end" test, a network communications test designed to reveal any specific areas of concern with the satellite and its ground controlling stations. The test involved the spacecraft and the IUS booster; the IUS control facility at the Air Force Consolidated Space Test Center (Sunnyvale, CA); the TRW plant (Redondo Beach, CA), where TDRS was manufactured; the TDRS ground station (White Sands, NM); Goddard Space Flight Center (Greenbelt, MD), the primary network operations center for TDRS; Space Shuttle Mission Control at

Johnson Space Center (Houston, TX); the MILA Tracking Station (Kennedy Space Center, FL); and the TDRS Checkout Station at Hangar AO and the IUS Checkout Station (Cape Canaveral Air Force Station, FL).

The end-to-end test checked the configuration of the satellite and its controlling NASA centers, allowing for simulated control of the spacecraft in the Orbiter's payload bay and in its eventual orbit in space. The test was completed October 17 without any surprises, prompting Schilling to reiterate that the spacecraft is in good health and work is on schedule. This week, TDRS and IUS will be powered up for additional power-on tests as preparations continue to ready the spacecraft and booster for delivery to Launch Complex 39B in mid-November. TDRS-F is scheduled to be launched aboard the Shuttle Endeavour in January 1993. [NASA/KSC News Release No. 146-92, Oct. 19, 1992.]

October 20:

STS 52: COUNTDOWN UNDERWAY

Columbia's payload bay doors were closed for flight today at 2:25 a.m.; the aft main engine compartment was closed yesterday. Technicians have also completed an aft compartment pressure check; they have washed down the pad and conducted a debris inspection. Work in progress: firing circuit verification check (PIC resistance) and loading Orbiter fuel cell cryogenic storage tanks (PRSD). Work scheduled: Orbiter midbody umbilical (OMBU) retract tonight; activate Orbiter communications systems overnight; load main engine computer controller software overnight; install mid-deck experiments on October 21; retract rotating service structure at 11 a.m. October 21; configure cockpit switches for launch; begin fuelling at 2:56 a.m. EDT October 22. The chance of acceptable liftoff weather on launch day is 70%. Clouds are forecast to be scattered, the temperature approximately 80 degrees, and winds are expected to be NE 12-18 knots. The concerns are for an RTLS crosswind violation and a slight chance of developing a low level ceiling, also an RTLS constraint. There are no technical issues or concerns for launch of the STS 52 mission. [SPACE SHUTTLE STATUS REPORT, Oct. 20, 1992.]

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RATS LOADED ONTO COLUMBIA

A dozen male albino rats part of a life science experiment studying osteoporosis were loaded aboard Columbia today. Astronauts tend to lose calcium in their bones during space flights; the experiment looks to preventing calcium loss (osteoporosis) on the ground. Loading the rats is the last major pad activity tonight before clearing the pad for propellant loading. Shuttle Program Chief Leonard S. Nicholson said today that "we're ready to go; everything is moving right along at a smooth pace." The major concern for tomorrow's launch is high crosswinds at the Shuttle Landing Facility. Launch rules call for winds no higher than 17 miles per hour and forecasts predict winds at between 13 and 21 mph. A second attempt may be made Friday if the winds prevent tomorrow's liftoff. [Banke, FLORIDA TODAY, p. 2A, Oct. 21, 1992.]

October 21:

STS 52: PHYSICS THEORY TEST

Scientists will test a Nobel Prize-winning theory which may have applications ranging from hurricane dynamics to superconductivity during Space Shuttle Columbia's STS 52 mission which is scheduled for launch tomorrow, October 22. The Lambda-Point Experiment (LPE), part of NASA's first United States Microgravity Payload (USMP-1), will study the strange behavior of helium at its critical temperature of 2.177 degrees above absolute zero (minus 459 degrees F). "Cryogenics and ultra-sensitive thermometry (measuring billionths of a degree) will be used to study the mysteries of changes in material

properties during phase transitions," said **Reuben Ruiz**, LPE Manager for NASA's Jet Propulsion Laboratory (Pasadena, CA). Phase transitions, such as those between water and steam or ice and water, are common in nature and technology and are well understood with certain exceptions. [NASA/KSC News Release No. 92-176, Oct. 21, 1992.]

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IBM/HONEYWELL WIN LOW TROPHY

IBM Federal Systems Co. (Houston, TX) and Honeywell, Inc., Space and Strategic System Operations (Clearwater, FL) have been named recipients of the 1992 George M. Low Trophy - NASA's Quality and Excellence Award. NASA Acting Deputy Administrator **Aaron Cohen** announced the selection last night at the Ninth Annual NASA/Contractors Conference on Quality and Productivity in Pasadena, CA. "These companies have not only made the commitment to improve, but they have demonstrated the courage to be measured on their progress," said Cohen. The Low Trophy recognizes NASA's prime contractors, subcontractors and suppliers for outstanding achievements in quality and productivity improvement and Total Quality Management (TQM). Key goals of the award are to internalize quality and productivity practices and TQM processes throughout NASA and the agency's contractors.

"The success of NASA's mission is dependent on the quality of the products and services our suppliers provide. The Low Trophy recognizes firms who are truly enhancing their overall quality," said Dr. **Laura Broedling**, Associate Administrator for the Office of Continuous Improvement. IBM Federal Systems has supported every crewed space flight. Support consists of both ground and onboard hardware and software, which include command and control, communications and administrative functions. Honeywell, Inc. built the flight control systems for the Space Shuttle and also built and rebuilt the original and improved main engine controllers. Honeywell also is providing stabilization and control systems for NASA's Space Station Freedom. [For a list of finalists, see the Low Trophy story above dated October 15.] [NASA/KSC News Releases No. 92-178, Oct. 21, 1992.]

October 22:

STS 52 LAUNCH

Columbia's STS 52 mission launched today at 1:09:39.0633 p.m. EDT after a nearly two hour delay while launch controllers waited for improved wind conditions at Kennedy Space Center. "The flagship of the fleet is back in space," radioed Commander **James D. Wetherbee** about 10 minutes after launch. Launch managers disagreed about whether to bend weather rules for the liftoff. Rules prohibit launches if winds at the space center are greater than 17 mph; higher gusts were recorded during the launch. There are three possible landing opportunities for Columbia at KSC on November 1: 7:31 a.m.; 9:05 a.m.; 10:38 a.m. EST. Which opportunity will be prime is under discussion by the Mission Management Team. [Broad, THE NEW YORK TIMES, p. A15, Oct. 23, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-6, Oct. 23, 1992; SPACE SHUTTLE STATUS REPORT, Oct. 23, 1992; SPACE SHUTTLE STATUS REPORT, Oct. 28, 1992.]

October 23:

DISCOVERY: PRE-FLIGHT PROCESSING

Technicians in Orbiter Processing Facility Bay 3 have completed changing out the left OMS Pod of Discovery and vibration testing of the Orbiter. They have also completed the galley water tank installation. Work in progress for STS 53: left OMS Pod electrical hookups; aft compartment closeouts; nose wheel hydraulic actuator trouble shooting;

galley water supply functional testing; solid rocket booster joint leak checks in the VAB. Scheduled work: left OMS Pod electrical IVT, leak check, and functional test; nosewheel steering retest; aft compartment positive pressure check; Orbiter positive pressure check; crew module closeouts; weight and center of gravity determination. Rollover of Discovery to the VAB is targeted for November 1. While a new launch date has not yet been set, NASA managers have decided that there will not be an attempt to launch during the week of Thanksgiving. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 23, 1992.]

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LAUNCH COMPLEX 39B: LITTLE DAMAGE

Preliminary inspections of pad B showed no abnormal damage to the due to the launch October 22 of Columbia's STS 52 mission. The Shuttle's Solid Rocket Boosters are due to arrive at Hangar AF this afternoon. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 23, 1992.]

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ENDEAVOUR: STS 54 PROCESSING

Main propulsion leak checks of Endeavour have been completed during the Orbiter's STS 54 processing in OPF Bay 1. Also completed: auxillary power unit hot oil flush; APU leak and functional checks; aft communications display panel changeout; postflight structural inspections; chin panel thermal protection rework; IUS/TDRS payload interface verification test (IVT) in the VPF; IUS/TDRS payload end-to-end test (ETE) in the VPF; IUS flight guidance system (RIMU) installation in the VPF. Work in progress: routine main engine changeout; vertical stabilizer inspections; crew hatch functional test; tire pressure checks; tile repair and replacement; payload bay light replacement; payload bay door bulb seal inspections. Work scheduled: window 5 and 6 replacement; potable water servicing; main engine leak checks; OMS electrical redundancy checks; Orbiter/external tank functional check; ammonia boiler servicing; Ku band antenna upper gimbal unit replacement; auxillary power unit servicing and functional checks; flight deck data display system multifunction test; flight deck communications system retest and installation of the waste containment system. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 23, 1992.]

October 24:

WETHERBEE: LAUNCH DECISION RIGHT

STS 52 Commander James D. Wetherbee said today that he agreed with Deputy Shuttle Program Director Brewster H. Shaw Jr.'s decision to launch Columbia October 22. "I guess I am kind of happy to leave those decisions to the folks on the ground who are well qualified to make those decisions," Wetherbee said. "I am confident that the folks had some good discussion and came to the decision they felt was right, and I'm willing to carry on with whatever decision that they come to. I'm sure the appropriate discussions went on and I'm very happy with the outcome." He went on to say: "There are many risks involved with the Space Shuttle program. We will never launch this vehicle without assuming some risk. We do manage that risk the best way we can. I think we do a very good job of managing that risk and minimizing that risk and I think, by the way, the science is worth going after." LAGEOS-2 was deployed at 9:57 a.m. yesterday. IRIS upper stage and LAGEOS apogee kick motor performance was nominal. [Halvorson, FLORIDA TODAY, p. 3A, Oct. 25, 1992; SPACE SHUTTLE STATUS SUMMARY, Oct. 23, 1992.]

October 26:

COMPUTER FIRMS SELECTED

NASA's Goddard Space Flight Center (Greenbelt, MD), has selected eight firms for negotiations leading to the award of nine separate Indefinite Delivery/Indefinite Quantity (ID/IQ), firm-fixed price contracts for seven classes of work stations and two categories of supporting equipment that comprise the Scientific and Engineering Work Station Procurement (SEWP). The SEWP is an open systems procurement based on government and industry standards. The nine ID/IQ contracts will have a potential value of approximately \$800 million over a 1-year basic contract period plus four 1-year options, according to Goddard officials. The firms and the classes and categories for which they have been selected are:

- * Class 1: Federal Computer Aided Engineering/Computer Aided Design Work Stations - SUN Microsystems (Mountain View, CA)
- * Class 2: CAE/CAD Mechanical Design Work Stations - Hewlett-Packard (Rockville, MD)
- * Class 3: Missions Operations Work Stations - Harris Computer Systems (Ft. Lauderdale, FL)
- * Class 4: Network Data Server Work Stations - IBM (Bethesda, MD)
- * Class 5: High Performance 3-D Graphics Work Stations - Silicon Graphics Inc. (Bethesda, MD)
- * Class 6: Multi-Purpose Computer Server Work Stations - Silicon Graphics, Inc.
- * Class 7: General Purpose Work Stations - Digital Equipment Corp. (Lanham, MD)
- * Class 8: X-Terminals/Printers Category - GTSI (Chantilly, VA)
- * Class 9: Network Equipment Category - Paramax Systems Corp. (Reston, VA)

This effort provides for all NASA and NASA-funded sites, the procurement of leading-edge, state-of-the-art computer work Stations at the lowest cost for both the scientific and engineering arenas. The contracts will also provide for the delivery, installation and maintenance of the equipment as well as the ability to expand the capabilities of the Work Stations by allowing the end-user to order from a sizable list of growth options. In addition, 10 percent of the total value of the requirement will be reserved for use by other government officials.

A further feature of this procurement is the development and maintenance of a unique test-site/trouble-shooting support group known as the "SEWP Bowl." The SEWP Bowl will be staffed by the government to manage the nine resultant contracts and to provide administrative and technical support for the end-users. Thirty day operational capability demonstrations for each class and category are expected to begin shortly. The nine contracts are expected to be awarded in December 1992. [NASA/KSC Release No. 92-183, Oct. 26, 1992; Smith, Government Computer News, pp. 3 & 73, Nov. 9, 1992.]

October 27:

STS 53: TESTS COMPLETED

In OPF Bay 3, technicians have completed a number of checks and tests upon Discovery prior to its STS 53 mission in November. Work completed: left OMS Pod functional test; left OMS Pod structural leak check and electrical checks; galley functional test. Work in progress: left OMS Pod closeouts; aft main engine compartment closeouts; nose wheel steering hydraulic trouble shooting; thermal protection system closeouts; crew module closeouts. Work scheduled: aft compartment positive pressure check; Orbiter positive pressure check; nose wheel steering retest; weight and center of gravity determination;

rollover to the VAB set for Sunday (November 1). [SPACE SHUTTLE STATUS REPORT, Oct. 27, 1992.]

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STS 65 MISSION SPECIALISTS NAMED

Leroy Chiao, Ph.D., and Donald A. Thomas, Ph.D., are assigned as Mission Specialists on the International Microgravity Laboratory-2, Space Shuttle Mission STS 65, scheduled for June 1994. "Both Don and Leroy bring strong materials science backgrounds to the IML-2 payload crew. Their strengths will complement the previously assigned crew members in achieving the multi-science objectives of this important international mission," said Acting Director of Flight Crew Operations Steven A. Hawley. Other crew members previously named to this microgravity mission are Payload Commander Richard J. Hieb and Chiaki Mukai, Ph.D. and M.D., a Payload Specialist from the National Space Development Agency of Japan.

Chiao, 32, holds a Ph.D. degree in chemical engineering from the University of California. Born in Milwaukee, WI, he was selected by NASA in 1990. He has worked on Space Shuttle flight software verification in the Shuttle Avionics Integration Laboratory and currently is working crew equipment issues in the Mission Development Branch of the Astronaut Office. Thomas, 42, has a doctorate degree in materials science from Cornell University. His dissertation involved evaluating the effect of crystalline defects and sample purity on the superconducting properties of niobium. He was born in Cleveland and, like Chiao, is a member of the 1990 astronaut class. He has worked on issues relating to the Shuttle Orbiter systems in the Safety and Operations Development Branches of the Astronaut Office. He currently is serving as CAPCOM, an astronaut in the Mission Control Center who communicates with the Space Shuttle crew members during a mission. [NASA/KSC News Release No. 92-187, Oct. 27, 1992; "NASA Assigns 2 to Flight," p. 9E, Nov. 1, 1992.]

October 28:

DISCOVERY: OMS WORK COMPLETED

Discovery's left orbital maneuvering system pod has been functionally tested and has undergone electrical checks while STS 53 pre-flight processing continues in OPF Bay 3. Work in progress: left OMS Pod leak check; aft main engine compartment closeouts; aft main engine compartment positive pressure check; nose wheel steering hydraulic trouble shooting; wheel well inspections; thermal protection system closeouts. Work scheduled: Orbiter positive pressure check; nose wheel steering retest; cockpit CRT #1 removal and replacement; weight and center of gravity determination; rollover to the VAB Sunday (November 1). [SPACE SHUTTLE STATUS REPORT, Oct. 28, 1992.]

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STS 53: MAY GO DECEMBER 2

NASA officials said today that Discovery's STS 53 mission may commence December 2; the mission's duration is seven days and is for the Department of Defense. A problem with one of Discovery's Orbital Maneuvering System Pods has brought about an 18-day delay. A terminal countdown demonstration test will run from November 11 through 12. The STS 53 crew includes: Commander David M. Walker, Pilot Robert D. Cabana and Mission Specialists Guion S. Bluford, Michael R. U. Clifford and James S. Voss. The firm launch date will be set following November 18's flight readiness review. [Halvorson, FLORIDA TODAY, p. 2A, Oct. 29, 1992.]

October 29:

DISCOVERY: COCKPIT CRT REPLACED

During its pre-STs 53 processing in OPF Bay 3, Discovery has had its cockpit CRT #1 removed and replaced. Technicians have completed nose wheel troubleshooting and retesting and a left OMS Pod structural leak check. Work in progress: left OMS Pod closeout; Orbiter positive pressure check; aft main engine compartment leak checks and closeouts; topping off tire pressures; thermal protection system (tiles) closeouts and a retest of the cockpit CRT #1. Work scheduled: crew compartment closeouts; weight and center of gravity determination; installation on Orbiter transporter; rollover to the VAB; mating to external tank/solid rocket boosters; rollout to Launch Complex 39A on November 6. [SPACE SHUTTLE STATUS REPORT, Oct. 29, 1992.]

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STS 52: COLUMBIA LANDING OPPORTUNITIES

There are three possible landing opportunities for Columbia at Kennedy Space Center on November 1 (Sunday) which are 7:31, 9:05, 10:38 a.m. EST. Which opportunity will be prime has not been finally determined by the Mission Management Team. The weather forecast calls for scattered low and high clouds, with a slight chance for fog or rainshowers within 30 nautical miles. Monday's forecast is similar, but with a reduced chance for fog, and a slightly greater chance for rainshowers within 30 nautical miles. Weather at Dryden is good on both Sunday and Monday. [SPACE SHUTTLE STATUS REPORT, Oct. 29, 1992.]

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FREEDOM'S 'EXPRESS PROGRAM'

A common complaint by space scientists is that it takes too long to conduct an experiment in space and get the data back. A new effort by the Space Station Freedom program has been initiated to dramatically reduce the time it would take to integrate small experiments on the Space Station Freedom. "It's called EXPRESS, for Expedited Processing of Experiments to Space Station," says Robert Moorehead, Deputy Director of Space Station Freedom. "We established the EXPRESS project because we are committed to developing a user-friendly Space Station through the small payloads program which will support innovative scientific, technological and commercial research through a streamlined payload integration process," Moorehead said.

Currently, it can take up to 5 years to get an experiment integrated on a Shuttle or Spacelab mission. "We hope we can cut the time it takes to get a small payload flown aboard Freedom to less than a year," says Mark Uhran, Manager of the EXPRESS Payload Project. "Freedom's three laboratories contain more than 40 refrigerator-sized experiment racks. These racks supply the experiments with electricity, cooling, data lines and other services," says Uhran. "They are called the International Standard Payload Racks because the services are identical in the United States, European and Japanese modules." [NASA/KSC Press Release No. 92-191, Oct. 29, 1992.]

October 30:

SLS-2 PAYLOAD SPECIALIST NAMED

NASA today announced the selection of Dr. Martin J. Fettman, D.V.M., as the prime Payload Specialist for the second Spacelab Life Sciences mission (SLS-2) scheduled for launch in August 1993. "NASA's series of SLS missions play a central role in our program of space biomedical research," said Dr. Lennard A. Fisk, Associate Administrator for the Office of Space Science and Applications. "The experiments that Dr. Fettman and his

12 crew members conduct will give us valuable information on how living and space affects the human body."

A professor in the Department of Pathology in Colorado State University's Veterinary Medicine, will join the previously named STS 58 crew consisting of Col. John E. Blaha (Col., USAF), Pilot Richard A. Searfoss (Maj., USAF), Payload Specialist Margaret Rhea Seddon (M.D.), and Mission Specialists William S. McArthur, Jr (USA), Shannon W. Lucid (Ph.D.) and David A. Wolf (M.D.) [NASA/KSC News Release 92-190, Oct. 30, 1992.]

STS 53: DISCOVERY'S PRE-ROLLOVER PREPARATIONS

In 3, technicians preparing Discovery for its December 2 STS 53 mission have completed Orbiter composite pressure check; they have also closed out the left OMS Port aft main engine compartment. Tire pressure checks and topoff have also been completed. Work in progress: aft main engine compartment leak check; crew compartment closeouts; thermal protection system closeouts; nose wheel steering troubleshooting. During a retest of the nose wheel steering system yesterday an intermittent control anomaly reappeared. Contingency time will be used to allow further troubleshooting. Work scheduled: nose wheel steering retest; weight and center of gravity determination; installation of the Orbiter on the transporter; rollover to the VAB on November 2. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 30, 1992]

ENDEAVOUR: OPF BAY 1, PROCESSING CONTINUES

Endeavour waste containment system has been installed in the Orbiter; other completed tasks include: routine main engine changeout; main propulsion system leak check; hatch functional test; payload bay flood light replacement; APU hot oil flush; IUS installation in the VPF. STS 54 work in progress: post installation main engine and electrical checks; water spray boiler servicing; potable water servicing; auxiliary unit lube oil servicing; OMS/RCS electrical redundancy checks; TDRS Ku band antenna upper gimbal removal and replacement; air-to-ground communications uplink; tile maintenance and water proofing; chin panel area rework; vertical stabilizer structural bolt changeouts; bulb seal repair; removal of windows 5 & 6 for seal replacement; installation of window #7; closeouts of SRB joints and nosecones in the Vehicle Assembly Building. Work scheduled: heat shield and carrier panel installation; leak check of the external tank/Orbiter quick disconnect; external tank/Orbiter door functional check; auxiliary power unit leak and functional checks; payload bay door #3 radiator; payload bay door radiator cleaning; waste containment system functional check; installation of drag chute door; beginning of Orbital midbody closeouts; IUS airborne abort equipment interface verification test; DXS payload installation; crew equipment interface test (CEIT). [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 30, 1992]

ILT STORAGE SITE LOCATED ON NASA PROPERTY

NASA and Florida Inland Navigation District (FIND) have agreed tentatively to dispose of river silt on KSC property. The silt was produced by dredging the Indian River ship channel in North Brevard County. Merritt Island National Wildlife Refuge Manager Ron High said that FIND "just kept asking until they asked the right question. The site now being considered has already been dug up and disturbed." The site had been used

by NASA for years to provide fill for KSC construction projects. NASA will allow FIND to use the site and FIND will pay for wetland restoration. [Fiorini, FLORIDA TODAY, p. 1B, Oct. 31, 1992.]

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AMF TO OPEN EDUCATION CENTER

James DeSantis, new President of the Astronauts Memorial Foundation, announced today that groundbreaking will occur December 11 for the Center for Space Education. "It will serve as the new home for NASA's enormously successful education programs," he said. NASA Deputy Administrator Charles F. Bolden made the keynote speech at a ceremony honoring outgoing AMF President Alan Helman. He remarked that the center would teach youngsters that "all science and math make sense." Bolden has recently been reactivated as an astronaut and will be commanding the first flight of Atlantis when it returns from California; the mission is tentatively scheduled for June 1994. ["Astronauts Foundation to Open Education Center," FLORIDA TODAY, p. 2B, Oct. 31, 1992.]

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FOG FORECAST CLOUDS LANDING PROSPECTS

The 7:31 a.m. EST landing opportunity for Columbia's STS 52 mission has tentatively been ruled out because of fog in November 1's weather forecast. The two remaining opportunities are 9:05 and 10:38 a.m. EST, with the 9:05 time tentatively selected as prime. If neither opportunity is achieved, a landing will be retargeted for KSC on November 2. [Date, THE ORLANDO SENTINEL, Nov. 1, 1992; SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 30, 1992; "Shuttle Heads Home Sunday," FLORIDA TODAY, p. 1A, Oct. 31, 1992; Halvorson, FLORIDA TODAY, p. 1A, Nov. 1, 1992.]

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EG&G: POSSIBLE LAYOFFS

Base Operations Contract employees of EG&G Florida today received notification that they would be "technically laid-off" if the company does not win the BOC recompetition. EG&G spokeswoman Judy Casper said that, in all likelihood, most of the incumbents would be picked up by the winner of the contract; only top managers would lose their jobs. ["EG&G Notifies of Possible Layoffs," FLORIDA TODAY, p. 20C, Oct. 30, 1992; Burnett, THE ORLANDO SENTINEL, pp. D-1 & D-4, Oct. 30, 1992; See also: "Lockheed Wins Base Operations Contract," Nov. 18 citation.]

NOVEMBER

November 1:

STS 52 LANDS SAFELY AT KSC

The Orbiter Columbia landed at the Kennedy Space Center this morning successfully ending a ten-day flight. After completing 159 orbits, the Orbiter touched down on KSC Runway 33 at 8:05:53 a.m. CST. That equates to a Mission Elapsed Time of 9/20:56:13. Drag chute deploy came at 8:06:07 a.m. CST. Wheel stop was at 8:06:53 a.m. Cst in a Mission Elapsed Time of 9/20:57:14. NASA's official record keeping designates end of mission as the time of main gear touchdown, so the official mission elapsed time for the STS 52 was 9 days, 20 hours, 56 minutes and 13 seconds. The Columbia traveled 4,129,028 statute miles during the STS 52 flight, which was the 51st mission of the Shuttle Program. The Orbiter's of NASA's Shuttle fleet have now traveled in excess of 120 million miles in space.

Kennedy Space Center Director Robert L. Crippen said, "This flight was chock full of work. That crew spent 10 days on orbit delivering satellites and performing science. They worked very hard at it. It was a superb mission as far as I'm concerned." Columbia will be moved from the runway to the Orbiter Processing Facility later this evening to begin processing for its next flight scheduled for February to conduct work in the Spacelab module in support of the German Spacelab D-2 mission. [Date, THE ORLANDO SENTINEL, pp. A-1 & A-5, Nov. 2, 1992; STS-52 LANDING STATUS REPORT, Nov. 1, 1992; Brown, Banke, Halvorson, FLORIDA TODAY, p. 1A-2A, Nov. 2, 1992; "Home Again," USA TODAY, p. 12A, Nov. 2, 1992.]

November 2:

DISCOVERY: STS 53 PREPARATIONS

Technicians in OPF Bay 3 have completed closeouts of Discovery's aft section and have conducted an Orbiter positive pressure test. Weight and center of gravity checks and crew compartment closeout have also been completed. Thermal protection system closeouts are in progress and preparations are underway for moving Discovery from its OPF bay to the Vehicle Assembly Building. Work scheduled: rollover to the VAB at approximately 5 a.m. November 3; mating with tank and boosters and all checkouts between November 3 and 7; rollout to Launch Complex 39A on November 8. [SPACE SHUTTLE STATUS REPORT, Nov. 2, 1992.]

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NASA BOOSTS FLORIDA ECONOMY

Space related employment and contracts at NASA's Kennedy Space Center yielded a \$1.587 billion growth to Florida's economy during the 1992 Fiscal Year which ended September 30. This represents an increase of about \$69 million over the previous year. Of KSC's expenditures, \$1.238 billion went to contractors operating on-site at the space center. An additional \$80 million went to off-site businesses in Brevard County. Other purchases and contracts awarded to Florida businesses outside of Brevard County totaled about \$43.3 million. Space center purchases and contracts to businesses out of state totaled about \$68 million. Civil service salaries and personnel benefits through the end of FY92 amounted to \$152 million, an increase of about \$10 million over last year. About \$125 million was for regular salary, lump-sum payments, overtime and awards programs. The remaining \$27 million went for additional personnel benefits. (The \$27 million civil service benefits package and \$68 million in out of state business awards increased KSC's total spending during the year to \$1.582 billion.) It is estimated that

approximately 92 percent of KSC's total spending, in the form of payrolls and purchase, remained in Brevard County.

Permanent federal employees at KSC totaled 2,676 during the same period. While 3,725 people were employed through construction and tenant jobs at KSC, the majority of the workers were employed by on-site contractors and numbered almost 12,300. Overall, approximately 18,700 workers were employed at KSC through the close of the Fiscal Year on September 30. Major contractors at KSC include Lockheed Space Operations Co., the Shuttle Processing Contractor; EG&G Florida Inc., the Base Operations Contractor; McDonnell Douglas Space Systems Col, the Payload Ground Operations Contractor; and Rockwell International Corp., the Shuttle Orbiter logistics support contractor. [NASA/KSC News Release No. 149-92, November 2, 1992; Banke, FLORIDA TODAY, p. 1A, Nov. 10, 1992.]

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COLUMBIA LITTLE DAMAGED

Columbia's brakes were undamaged by its November 1 landing at KSC and its tires incurred only minor scuffing during the touchdown and roll to a stop. Of the 27,000 tiles which make up the Orbiter's thermal protection system, only about 110 had even minor damage. One of these will be replaced and another 65 will be removed for routine maintenance. "She's a beast on the ground, but boy when she gets in the air she just Cadillacs right along. She really did a great job," said Columbia's Processing Manager Bascom Murrah. NASA's Flight Director who was in charge of the re-entry and landing, Jeff Bantle, said, "Any landing that does no damage to the vehicle is a good landing." [Date, THE ORLANDO SENTINEL, Nov. 3, 1992; Halvorson, FLORIDA TODAY, p. 2A, Nov. 3, 1992.]

November 3:

DISCOVERY ROLLS OVER TO VAB

Discovery began its journey to Launch Complex 39A by being mated to the Orbiter transporter and rolling over from OPF Bay 3 to the Vehicle Assembly Building; the first motion was at 8:15 a.m. Once in the VAB, the Orbiter was mated to its external tank and solid rocket boosters. The Orbiter lifting sling was also attached. Work scheduled: establishing electrical connections tomorrow; beginning the Shuttle interface test on November 5. Rollout to LC 39A is set for November 8 at 12:30 a.m. The terminal countdown demonstration test is set for November 12-13. [SPACE SHUTTLE STATUS REPORT, Nov. 3, 1992.]

November 3:

GOLDIN FILLS TOP NASA POSITIONS

NASA Administrator Daniel S. Goldin today announced the appointment of Dr. Charles Pellerin as Associate Deputy Administrator for Strategic Planning, John R. Dailey as Associate Deputy Administrator and Ralph C. Thomas as Assistant Administrator for Small and Disadvantaged Business Utilization. Dailey and Thomas were selected after a nationwide search and review. Charles Pellerin, a 25-year NASA employee, was most recently Deputy Associate Administrator for Safety and Mission Quality. "Dr. Pellerin has a broad knowledge of L and will be responsible for creating a strategic plan to implement the agency's vision, mission and values," Goldin said. "He also will direct and oversee key elements of the strategic plan."

John R. Dailey will plan, direct and manage the institutional operations required to accomplish NASA's roles and missions. He comes to NASA from the Marine Corps,

having retired in September 1992, from the position of Assistant Commandant. "Jack Dailey brings a remarkable background in system acquisition, strategic planning, total quality management and experience in the operation of government at its higher levels," Goldin said. Thomas, formerly the Executive Director of the National Association of Minority Contractors, will become the first Assistant Administrator for Small and Disadvantaged Business Utilization. "Ralph Thomas will spearhead a determined effort to see that small and minority-owned businesses play a significant role in America's civil space and aeronautics programs," Goldin said. [NASA/KSC News Release No. 92-194, Nov. 3, 1992.]

November 4: DISCOVERY HARD MATED TO TANK/BOOSTERS

Discovery, now in High Bay 3 of the Vehicle Assembly Building, has been hard mated to its external tank and twin solid rocket boosters. The assembled Shuttle stack was rolled over to the transfer aisle in the VAB at 8:15 a.m. yesterday. Work in progress for STS 53: removal of the lifting sling; establishment of the electrical connections between Discovery and the stack; preparations for the Shuttle interface test (SIT). Work scheduled: the mechanical and electrical portions of the Shuttle interface test will occur on November 5 and 6, respectively; removal of the access platforms and positioning of the crawler transporter; rollout to Launch Complex 39A is set for November 8 at 12:01 a.m. "Assuming we do rollout on Sunday [November 8], that would make possible achieving a launch during the first week of December," said Kennedy Space Center spokesman George Diller today. The terminal countdown demonstration test for STS 53 remains scheduled for November 12-13. Workers are readying the external tank/solid rocket booster stack for Endeavour's next mission at the beginning of the new year; the Orbiter's payload - a communications satellite - is being delivered to Launch Complex 39B on November 9, Diller said. [Space Shuttle Status Report, Nov. 4, 1992; Banke, FLORIDA TODAY, p. 8A, Nov. 5, 1992.]

November 5: STS 53: LIFTING SLING REMOVED

In the Vehicle Assembly Building, workers have removed Discovery's lifting sling and completed the mechanical and electrical mating of the Orbiter with its stack. Tail service mast connections to Discovery have also been made. The mechanical portion of the Shuttle interface test is underway today in the VAB. Work scheduled: the electrical portion of the Shuttle interface test; removing the access platforms and positioning the crawler prior to rollout; rolling out Discovery on November 8; TCDT on November 12 and 13 and a flight readiness review on November 19. [SPACE SHUTTLE STATUS REPORT, Nov. 5, 1992; Banke, FLORIDA TODAY, p. 4A, Nov. 6, 1992.]

I STS 54 PAYLOAD AND EXTERNAL TANK

In VAB High Bay 1 today, the STS 54 external tank is being mated to the solid rocket boosters. In the Vertical Processing Facility today, the STS 54 payload (TDRS-F/IUS-13) is being installed into the payload canister in preparation for transportation to Launch Complex 39B on November 9. In OPF Bay 1 this weekend, Endeavour's crew equipment interface test (CEIT) with the STS 54 flight crew on hand is scheduled. [SPACE SHUTTLE STATUS REPORT, Nov. 5, 1992.]

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KSC SPONSORS THIRD BREVARD BUSINESS EXPO

About 200 exhibitors representing small businesses, government agencies, prime contractors and large corporations will be accessible to the public on November 10 at the KSC Business Opportunities Expo '92, from 9:00 a.m. to 3 p.m. at Cruise Terminal 5, Port Canaveral. Cosponsored by KSC's Small and Small Disadvantaged Business Council and the Canaveral Port Authority, this trade fair is an opportunity to match buyers, contract specialists, engineers and technical representatives with businesses. Most of the exhibitors will be from small businesses.

"One of the objectives of the KSC Council is to establish closer relationships between NASA, prime contractors and the business community. The expo is one tool for accomplishing that objective," said Ann Watson, Chief, Industry Assistance and Acquisition Management Staff, Procurement Office. "This is KSC's third annual expo which has gotten bigger and better each year," she added. Representatives from government agencies and prime contractors will provide counseling services to members of industry seeking potential markets for their supplies and/or services. In addition, they will provide information on future acquisition opportunities. [NASA/KSC News Release No. 151-92, Nov. 5, 1992; Randall, FLORIDA TODAY, p. 20C, Nov. 10, 1992; NASA/KSC Release No. 153-92, Nov. 1992.]

November 6:

DISCOVERY MATING COMPLETED

In the VAB's high bay 3, Discovery has been mated with its external tank and solid rocket boosters in preparation for its STS 53 mission; rollout to Launch Complex 39A is set to occur November 8. Discovery is expected to be hard down at the pad by 2:45 p.m. Today, however, Discovery is undergoing the electrical part of its Shuttle Interface test. Scheduled for next week: rollout; auxiliary power unit hot firing early November 9 and commencement of inertial measurement unit calibration; main engine flight readiness test on November 10; helium signature test November 11 and the terminal countdown demonstration test on November 12 and 13. [Space Shuttle Weekly Status Summary, Nov. 6, 1992; Banke, FLORIDA TODAY, p. 5A, Nov. 7, 1992.]

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ENDEAVOUR: IN OPF BAY 1

The TDRS/IUS payload is being installed in the transport canister in the Vertical Processing Facility in preparation for the STS 54 mission. Endeavour, in OPF Bay 1, has had Orbiter window #6 removed and replaced. L3A and L5D (two reaction control system thrusters) have been replaced. Technicians are conducting OMS/RCS flight control system checkouts and OMS Pod redundancy checks. Other completed tasks include: auxiliary power unit water servicing; auxiliary power unit leak and functional checks; potable water servicing; waste containment system installation; star tracker door functional test. Work in progress: drag chute door installation; bulb seal repair; midbody closeouts; heat shield installation; torque readjustment of vertical stabilizer bolts; auxiliary power unit leak and functional checks; tile water proofing. Scheduled work: crew equipment interface test (CEIT) for November 7; ammonia boiler servicing November 8; waste containment system checkout and functional test; payload airborne support equipment interface verification test; changeout of reaction control system (L3A) thruster bellows; payload bay cleaning commences; move of TDRS/IUS payload to Launch Complex 39B November 9; installation of DXS payload in the Orbiter's payload bay on November 10. [Space Shuttle Weekly Status Summary, Nov. 6, 1992.]

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COLUMBIA: STS 55 PROCESSING

Columbia is being processed now (OPF Bay 2) for its late February 1993 STS 55 mission. Completed work: Orbiter initial post flight safing; Orbiter jack and level; establishment of Orbiter access; attachment of payload bay door strongback; opening of payload bay doors. STS 55 work in progress: post flight Orbiter inspections; main engine inspections; window inspections and polishing; cleaning and inspection of the star tracker; removal of USMP payload from the payload bay; Ku band antenna testing; Spacelab D-2 mission sequence test in the O & C building; auxiliary power unit lube oil deservicing. Scheduled work: hypergolic deservicing; forward reaction control system removal; removal of main engine heat shields; removal of waste containment system; removal of wheels and tires. [Space Shuttle Weekly Status Summary, Nov. 6, 1992.]

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SATELLITE RESCUE ABILITY/COVERT GROUP

A task group, looking into issues concerning future satellite rescue and repair, says NASA should continue to perform such missions, but only when they "produce genuine benefits to U.S. interests in view of the inherent risks to the Shuttle and its crew." Task force Chairman Dr. Eugene E. Covert said, "The unique ability to accomplish satellite rescue and repair should not be forfeited, but these missions pose inherent risks to the Shuttle and should be undertaken only when the benefits outweigh the risks." Covert added the authority to employ this capability should rest solely with the NASA Administrator. The NASA Advisory Council Group Task Force was established at the direction of NASA Administrator Daniel S. Goldin. Chairman Covert is a professor of Aeronautics and Astronautics at Massachusetts Institute of Technology. Vice Chairman was former astronaut Lt. Gen. Thomas Stafford, USAF (ret). The charter of the group was to recommend "a policy outlining the criteria, the design standards and the pricing model to guide NASA in assessing the responsibilities for government and non-government satellite rescue and repair missions." [NASA/KSC News Release No. 92-197, Nov. 6, 1992.]

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CAUSES OF TSS MALFUNCTIONS

The report of NASA's Tethered Satellite System Investigative Board was released today, presenting the panel's findings on problems which prevented full deployment of the satellite during Space Shuttle mission STS 46. The 47-page report examined five problems that occurred during the deployment effort and identified causes for four of them. It made recommendations for actions to be taken to prevent similar occurrences in the future. The board said the two snags during deployment and retrieval - when first releasing the satellite from the deployer and when the satellite was at 735 feet - were due to slack which developed in the tether at a point where it moves between one pulley and another - somewhat similar to movie film misfeeding in a projector. "The crew found a way to procedurally get around this slack problem," said Board Chairman Darrell Branscome. "In both cases the jamming was overcome. By itself, this problem would not have prevented us from fully deploying the satellite."

NASA previously had reported on August 28 that the cause of the unplanned stops at 587 and 840 feet was a mechanical obstruction - a protruding bolt - which prevented part of the tether reel mechanism from moving across its full range of travel. "We contacted the bolt when the satellite was out at 587 feet," said Branscome. "What we learned from our ground simulations was that in spite of the bolt obstruction, it was possible to pull additional tether off the reel, out to 840 feet." According to the report, the bolt was part

of a hardware change made late in the review process and should have been caught in the systems engineering review. "The board made some excellent recommendations in the report on how to deal with things like late changes to the hardware," said Jeremiah W. Pearson III. "We are going to look carefully at their recommendations and apply the lessons learned from this flight to future missions." No plausible scenario has been validated by post-flight demonstration regarding difficulty in retracting one of two umbilicals between the tethered satellite and deployer. Based on its findings, the board recommend several specific hardware assessments and modifications which should be made to other elements of the tethered system if NASA decides to refly it. The board was formed on August 12 by Pearson, NASA Associate Administrator for Space Flight. The six-member board included representatives from various NASA centers and the Italian Space Agency. [Date, THE ORLANDO SENTINEL, Nov. 7, 1992; NASA/KSC News Release No. 92-196, Nov. 6, 1992; Banke, FLORIDA TODAY, p. 5A, Nov. 7, 1992.]

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DELTA LAUNCH SCRUBBED

An apparent valve failure kept a Delta rocket's main engine and nine solid rocket boosters from igniting and launching on an Air Force mission. The rocket remained bolted to the pad. "The flash you saw from the vehicle was what appears to be the vernier engine start. There was no main engine start and no ignition signal sent to the solids," said Air Force Maj. Garlan Perugini, Director of Public Affairs, 45th Space wing. The cause of the failure was not immediately known, but a similar failure occurred on May 24, 1989, and, in that instance, the failure was traced to a valve that had not opened when the countdown reached zero. The mission had not been rescheduled as of November 8. [Date, THE ORLANDO SENTINEL, Nov. 7, 1992; Halvorson, FLORIDA TODAY, p. 5A, Nov. 7, 1992; Halvorson, FLORIDA TODAY, p. 4A, Nov. 8, 1992.]

November 8:

DISCOVERY ROLLS TO LC 39A

Discovery made a start, then stop, then start again rollout to Launch Complex 39A this morning. Shortly after beginning its rollout from the VAB at 7:20 a.m., the transporter had to be stopped. "We had to stop just outside the barn [VAB] because we had a steering problem we had to fix [on the Shuttle transporter]," said Dick Young, KSC spokesman. "It was no big deal." Following repairs, the transporter moved again at 9:20 a.m. Arrival and hard down at the pad came at 1:07 p.m., according to Young. Tentative launch date for Discovery's five member crew is December 2. [Halvorson, FLORIDA TODAY, p. 1A, Nov. 9, 1992; Halvorson, FLORIDA TODAY, p. 1A, Nov. 8, 1992.]

November 9:

DISCOVERY: RSS CLOSED

At Launch Complex 39A the rotating service structure is closed around Discovery which awaits its payload and the start of its STS 53 mission. The Orbiter has been powered up; it achieved hard down status November 8 at 1:07 p.m. Work in progress today: launch pad validations; inertial measurement unit (IMU) calibrations; X-rays of reaction control system bellows; solid rocket booster flight readiness test. Work scheduled: main engine flight readiness test November 10; STS 53 astronaut arrival at the Shuttle Landing Facility tomorrow to take part in the terminal countdown demonstration test scheduled for November 12 and 13. A helium signature leak test will be conducted on November 11 and an auxiliary power unit hot firing will occur this weekend. The IUS/TDRS payload left the Vertical Processing Facility last night as scheduled but is currently in the Vehicle Assembly Building awaiting improved weather conditions before continuing on to Launch Complex 39B. [SPACE SHUTTLE STATUS REPORT, Nov. 9, 1992.]

November 10:

OPEN HOUSE SET FOR NOV. 21

In celebration of the International Space Year, KSC is hosting an open house for all of its employees and their families on Nov. 21. The feature attraction is expected to be the Space Shuttle Endeavour, which is scheduled to be rolled from the Orbiter Processing Facility to the Vehicle Assembly Building transfer aisle where it will be on display. Thousands of KSC employees and family members are expected to visit Kennedy Space Center and view Endeavour. They will also be permitted to drive around Shuttle Launch Complex 39B, visit the Launch Control Center, the Shuttle Landing Facility, the Thermal Protection System Facility, the Solid Rocket Booster Assembly and Refurbishment Facility and the NASA News Center. Also open to visitors will be a solid rocket booster recovery ship to be located at the turn basin adjacent to the News Center. [NASA/KSC Release No. 153-92, Nov. 1992; Banke, FLORIDA TODAY, p. 2A, Nov. 21, 1992; Banke, FLORIDA TODAY, p. 2A, Nov. 22, 1992.]

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1993 PAYLOAD PROCESSING

Even though there is one more Shuttle launch in 1992, next year's buffet of American and international payloads to be launched aboard the Space Shuttle are in various stages of preparation at KSC. Some are first-time flyers and others will be continuing a program of flights aboard the Orbiter as NASA's international partners in space. These include the second German Spacelab module to fly on the Shuttle; the ATLAS-2, a pallet and igloo of experiments; and the second Space Life Sciences spacelab module. In addition, the first Spacehab payload to be flown aboard the Shuttle will arrive at KSC in January, 1993. [NASA/KSC Release No. 153-92, Nov. 1992.]

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KSC DEVELOPS NEW PROTECTIVE COATINGS

KSC is spearheading the industry in developing a revolutionary protective coating to safeguard metals such as steel and aluminum and which could have unlimited possibilities in the private sector. These coatings will be used on the Shuttle launching pads and various support equipment to guard against the corrosive effects of launch and the seaside environment. This primer coating could have applications for off-shore oil rigs, automobile parts, underground tanks, bridges and aerospace structures. Several leading coating industries have recently bid on a contract to develop the highly sought-after commercial product. [NASA/KSC Release No. 153-92, Nov. 1992.]

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FLORIDA ECONOMY LIFTED BY SHUTTLE

NASA spent \$1.48 billion in the 1992 budget year on launching Shuttles. "The numbers reinforce what an important cornerstone that facility [KSC] is to Brevard and to the entire region. We always look forward to the release of those figures," said Brevard Economic Development Corp. President Larry Wuensch.

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NEW FREON RECOVERY SYSTEM

KSC is working with a new recovery system used to capture unused freon from Space Shuttles following their mission and return to Kennedy Space Center. Freon is used for the cooling of Orbiter electronic avionics, payloads and the crew module. Due to information that indicates freon is harmful to the environment, proper disposal is practiced at KSC. [NASA/KSC Release No. 153-92, Nov. 1992.]

STS 53: LAUNCH PAD VALIDATIONS

Technicians at Launch Complex 39A have completed pad validations prior to Discovery's STS 53 mission liftoff, now targeted for the first week in December. The solid rocket motor flight readiness test has also been completed. Work in progress: inertial measurement unit (IMU) calibrations; X-rays of reaction control system bellows; main engine flight readiness test; changeout of right booster integrated electronics assembly; STS 53 astronaut arrival at the Shuttle Landing Facility today at 4:30 p.m. EST. Scheduled: helium signature leak check of main propulsion system November 11; test of right booster hydraulics and IEA November 11; astronaut emergency egress training November 11 and 12; Shuttle training aircraft flights on November 11 and November 12; TCDT count begins at 8 a.m. November 12 and reaches T-0 at 11 a.m. November 13; changeout of SRB fuel isolation valves on November 13; auxiliary power not firing this weekend. [SPACE SHUTTLE STATUS REPORT, Nov. 10, 1992; Banker, FLORIDA TODAY, p. 5A, Nov. 11, 1992.]

M: STS 53 CREW TRAINS AT KSC

By the STS 53 crew of Discovery will learn how to use the emergency egress system at Launch Complex 39A; in an emergency the astronauts would climb into the slidewire net for a rapid ride down the 1,200-foot wire to a bunker on the west side of the pad. "The usual drill; nothing out of the ordinary," said KSC spokesman George Diller. The final countdown demonstration test begins tomorrow at 8:00 a.m. and runs until 11:00 on Friday morning. Today workers tested a spare electronics assembly on the right-hand solid rocket booster; it replaces an assembly which failed last week. Technicians conducted an important test of the main propulsion system, the helium signature test. [Halvorson, FLORIDA TODAY, p. 2A, Nov. 12, 1992.]

R: NASA PERSONNEL CHANGES

NASA Administrator Daniel S. Goldin today announced that Paul F. Holloway, in addition to his responsibilities as Director of Langley Research Center (LaRC) (Hampton, VA), will primarily be assigned to NASA Headquarters as a special assistant to the administrator. "Paul has a distinguished record of service with NASA and has provided unparalleled leadership at Langley. I'm very pleased to announce his new position as special assistant at Headquarters, where he will be intimately involved with the day-to-day operations of the agency," said Goldin. The Administrator also announced today that Don Bush, Assistant Administrator for Procurement, would be leaving the agency on January 11, 1993. Bush, who joined the agency in 1990 after numerous assignments in the Department of Defense, plans to pursue opportunities in the private sector. [NASA/KSC Release No. 92-202, Nov. 12, 1992; "Goldin Announces Appointments," FLORIDA TODAY, p. 9E, Nov. 15, 1992.]

[DISCOVERY: PRE-LAUNCH STATUS

At Launch Complex 39A, technicians have completed Discovery's inertial measurement unit calibrations; changing out and retesting the right booster's integrated electronics assembly (IEA); the Space Shuttle main engine (SSME) flight readiness test (FRT); main propulsion system helium signature leak check and leak checks of the Orbiter/external tank quick disconnects. Work in progress prior to the STS 53 mission of Discovery: final countdown demonstration test (TCDT); X-rays of the reaction control system bellows; star tracker inspection; astronaut emergency egress training at Pad 39A; and

Shuttle training aircraft (STA) flights. Work scheduled: conclusion of the 11 a.m. November 13; changeout of the left and right SRB fuel isolation valves; OMS/RCS hypergolic propellant loading activities during the weekend of the rotating service structure for performance of an APU hot firing on November 13. SPACE SHUTTLE STATUS REPORT, Nov. 12, 1992; Halvorson, FLORIDA TODAY, Nov. 13, 1992.]

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CHUTE MADE COLUMBIA VEER

When Columbia landed at Kennedy Space Center to conclude its mission, it veered ten to fifteen feet off the 300-foot wide runway's center line. It is said today that the Orbiter's drag chute had caused the vehicle to veer. "A drift of a pull; ten to fifteen feet on a 300-foot wide runway is not a big deal. It doesn't cause me any concern at all," said Columbia's commander James D. Wetherbee and Pilot Robert L. "Hoot" Gibson countered the drift by stepping on rudder pedal and using the nose wheel steering system to control the Orbiter. The drifting appears to occur only when the chute is deployed before the parachutes down on the runway. Discovery commander David M. Walker said, "It's a major concern for us, provided we understand the conditions under which we deploy it. We're still gathering data, but I'm not concerned that if we do the test we have any problems." The possibility of modifications is being explored by NASA. Columbia may land at Edwards Air Force Base, CA, in order for NASA scientists to closely study the effects of crosswinds. [Halvorson, FLORIDA TODAY, p. 2A, Nov. 13, 1992; FLORIDA TODAY, p. 1A, Nov. 14, 1992.]

November 13:

DISCOVERY: STS 53 PRE-LAUNCH WORK

At Launch Complex 39A, technicians have completed X-rays of the control system bellows and have inspected the Discovery's star tracker. Work on terminal countdown demonstration test (TCDT); changeout of the left SRB fuel isolation valves and the launch readiness review (LRR). OMS and RCS loading will take place November 14 and 15; the rotating service structure mated on November 16. SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 13, 1992.

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ENDEAVOUR: STS 54 PREPARATIONS

Endeavour's next mission - STS 54 - is targeted for the second week of 1993. The six-day mission will have a crew of five and deploy the TDRS-F and X-Ray Spectrometer (DXS). Presently in OPF Bay 1, the mission's crew equipment test (CEIT) has been completed. Other completed tasks include: armorvicing; payload airborne support equipment Interface Verification Test; transfer of TDRS to Launch Complex 39B; installation of DXS payload in cargo bay on November 16. Work in progress: OMS thruster reaction control system removal and replacement; drag chute closeouts/door installation; Orbiter's door functional testing; waste containment system functional testing; main system leak checks (hydrogen side); mid-body closeouts. Work scheduled: flight controls and aerosurfaces; tire checks/pressure topoff; aft compartment leaks and closeouts; Orbiter structural leak checks; crew compartment closeout; fueling at LC 39B. SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 13, 1992.

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COLUMBIA: STS 55 PROCESSING WORK

In OPF Bay 2, a number of processing tasks on Columbia have been completed: USMP payload removal; remote manipulator arm (RMS) removal; main engine heat shields removal; waste containment system removal; wheels and tires removal; hypergolic system and APU deservicing; post flight system inspections; main engine inspections; Ku band antenna testing; Spacelab D-2 mission sequence test. Work in progress for STS 55: powering up Orbiter systems electrical testing; forward reaction control system deservicing and removal preparations; main engine removal; main propulsion system leak checks (hydrogen side); wheel and tire re-installation; star tracker door cycle testing; left hand payload bay door radiator #1 inspections; tile repair and replacement. Work scheduled: removal of window #1; removal of the forward reaction control system; removal and replacement of the freon pump package; crew hatch functional test; S-Band air-to-ground antenna testing; drag chute system deservicing; Orbiter structural inspections. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 13, 1992.]

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STS 53: LAUNCH READINESS REVIEW

The Launch Readiness Review for Space Shuttle mission STS 53 was held today at KSC. Following the review, KSC mission managers deemed Shuttle Discovery and the KSC launch team ready to support launch during the first week of December. A firm launch date will be determined at the Flight Readiness Review scheduled for Thursday, November 19, at Kennedy Space Center. Speaking of the role of the managers in the FRR, KSC spokesman George Diller said, "They'll go through everything Discovery has been through since its last flight." Discovery last flew in January and since that mission, the Orbiter has been closely inspected and extensively modified. A drag chute has been installed; improvements were made to the nose wheel steering mechanism and improved auxiliary power units have been added. At Launch Complex 39B, technicians are fueling Endeavour's prime cargo, the Tracking and Data Relay Satellite. Endeavour will roll to the launch pad next week. [Buckingham, Nov. 13, 1992, KSC Press Site; Halvorson, FLORIDA TODAY, p. 2A, Nov. 17, 1992.]

November 15:

PITTNER RECEIVES SILVER SNOOPY

"We are very proud that Dan [Pittner] has received this [Silver Snoopy] award," said John Millon, Boeing Inertial Upper Stage Program Manager. "He is a skilled and highly motivated person whose goal is 100 percent flight success and safety. After a redundant inertial measurement unit failed on STS 44, Dan's quick turnaround in removing, replacing and retesting the unit allowed a successful Defense Department launch and flight." Pittner was presented his award by astronaut Andrew M. Allen. ["Boeing Employee Receives Silver Snoopy," FLORIDA TODAY, Nov. 15, 1992.]

November 16:

DISCOVERY: CRUCIAL TEST

A hot firing of Discovery's auxiliary power units will occur today; it is a crucial pre-launch test that will enable final preparations to continue. The test will take place at 10 p.m. following the retraction of the rotating service structure at 6:00 p.m., according to KSC spokesman George Diller. He said, "Right now, we're right on schedule." Last weekend, workers loaded propellants into the Orbiter's onboard storage tanks. SRB fuel isolation valves have been changed out and technicians have finished work in the X-ray reaction control system thrusters. Also scheduled for today are OMS/RCS fuel system disconnects and purges. Technicians will begin SRB closeouts and Orbiter aft

compartment closeouts November 18; final ordnance work will begin Nov. 22. [Brown, FLORIDA TODAY, p. 2A, Nov. 15, 1992; Brown, FLORIDA TODAY, p. 3A, Nov. 16, 1992; SPACE SHUTTLE STATUS REPORT, Nov. 16, 1992.]

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LAUNCH COMPLEX 39B ACTIVITIES

Fueling operations for the TDRS-F payload at Launch Complex 39B will be conducted Tuesday (November 17) through Thursday (November 19). On Orbiter Endeavour in OPF Bay 1, bellows changeout on one of the RCS thrusters is in work and on schedule. Cleaning of the payload bay is underway in preparation for closing the payload bay doors Wednesday night. The Orbiter structural leak check will follow on Thursday, with aft compartment closeouts and the weight and center of gravity determinations set for Friday, November 20. Rollover to the Vehicle Assembly Building transfer aisle is targeted for 3rd shift on the morning of November 21. [Banke, FLORIDA TODAY, p. 9E, Nov. 15, 1992; SPACE SHUTTLE STATUS REPORT, Nov. 16, 1992.]

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DISCOVERY: PRE-LAUNCH STATUS

Post-test analysis of the Discovery's APU hot firing data showed that the #1 fuel pump inlet pressure transducer had a higher than acceptable reading. This device furnishes APU fuel pressure information. Whether the unit will require a changeout is under discussion. If this work is done, about a day of two of the remaining days of contingency time will be necessary to complete the activity. The primary payload of STS 53 has been delivered to Launch Complex 39A. The mission is for the Department of Defense. Work in progress: connection of Orbiter midbody umbilical (OMBU); liquid oxygen pump leak checks; aft main engine compartment and crew compartment cleaning. Work scheduled: vehicle powering up; OMBU leak checks also; beginning SRB closeouts and Orbiter aft closeouts; installation of contingency EVA space suits; installation of the primary payload; Orbiter/payload interface verification test (IVT); final ordnance work November 22. [SPACE SHUTTLE STATUS REPORT, Nov. 17, 1992; Halvorson, FLORIDA TODAY, p. 1A, Nov. 18, 1992.]

November 18:

DISCOVERY: STS 53 PREPARATIONS

The decision on whether to changeout the #1 fuel pump inlet pressure transducer will be made at the flight readiness review for STS 53. A fly-as-is option is under assessment; if the changeout is made, contingency time on November 21 could be used for the activity. Meanwhile, mating of Discovery's mid-body umbilical has been completed at Launch Complex 39A. Work in progress: closure of the rotating service structure; powering-up of the Orbiter; leak checks of the Orbiter Midbody Umbilical (OMBU); beginning of solid rocket booster closeouts; beginning of avionics bay closeouts; start closeouts of the Orbiter aft main engine compartment; continue aft main engine compartment and crew compartment cleaning; troubleshooting APU #1 fuel pump inlet pressure transducer. Work scheduled: installation tomorrow of contingency EVA space suits and primary payload. The flight readiness review will be conducted also be conducted November 19. The Orbiter/payload interface verification test (IVT) will be held November 20 and final ordnance work should be completed November 22. [SPACE SHUTTLE STATUS REPORT, Nov. 18, 1992.]

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LOCKHEED WINS BASE OPERATIONS CONTRACT

Lockheed Space Operations Company won out over three competitors to win Kennedy Space Center's base operations contract, worth an estimated \$1.9 billion over the ten years of the contract. After the first four years, there will be two three-year options. Lockheed will now become the second-largest employer in the county, after Harris Corp. Gerald Oppiger, president of Lockheed, said, "We are delighted with this contract award. I'm very gratified that NASA has demonstrated such confidence in us, and I'm proud of the outstanding proposal our people turned in." (Melbourne, FL). EG&G Florida has operated the contract for the past ten years. Lockheed officials said they expected to re-employ the "vast majority" of current BOC employees, but spokesman John Williams said, "I would think that the work force would be smaller." He did not say how much smaller. Lockheed already employs 6,200 as the Shuttle processing contractor. The new base operations contract includes security services, doctors and nurses at the occupational health facility, firefighters, computer technicians, janitors and handlers of toxic rocket fuel. Lockheed will subcontract such services as the Kennedy Space Center Library and mail operation.

EG&G president James Dubay said, "Obviously we are extremely disappointed about the news that we weren't selected, because we know we provided outstanding service to NASA. We don't yet have any specifics about why we weren't selected, so we cannot comment any further except to say that we want the transition process to be as smooth as possible for our employees and we will cooperate fully with NASA and Lockheed to ensure that occurs." NASA Procurement chief Wes Dean said, "It was a very close competition." He said he would have no specifics on the evaluations until after he has debriefed the losing companies; that will take two or more days. [Date, THE ORLANDO SENTINEL, p. C-1, Nov. 19, 1992; Liden and Halvorson, FLORIDA TODAY, pp. 1A-2A, Nov. 19, 1992; Reitz, FLORIDA TODAY, Nov. 19, 1992; KSC News Release No. C92-20, Nov. 18, 1992; Suskind, THE WALL STREET JOURNAL, p. A5, Nov. 19, 1992; Boylan, FLORIDA TODAY, Nov. 26, 1992.]

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BONEBERGER WINS SNOOPY AWARD

Joyce Boneberger has been awarded a Silver Snoopy by Astronaut Andrew Allen for her role in saving money and time by developing a set of electronic mail procedures for secretaries who log onto KSC's computer network. Boneberger is a secretary for McDonnell Douglas. ["McDonnell Douglas," STAR-ADVOCATE, Nov. 18, 1992.]

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CRANE INVESTIGATION CONCLUDES

An investigation board, chaired by Jackie E. Smith, Director of Safety and Reliability, has completed a thorough review of cranes used in lifting flight hardware inside the 52-story Vehicle Assembly Building (VAB). Center Director Robert L. Crippen appointed an investigation board to examine an August 11 incident involving a 250-ton crane that suddenly and unexpectedly accelerated while moving a Space Shuttle solid rocket booster segment in High Bay 1 of the VAB. Although unable to determine the exact reason, the board found that the most probable causes of the crane's sudden movement were contamination in the motor generator and excessive resistance of the relay contacts in the crane's control system. The generator, known as a metadyne, amplifies an operator initiated control signal to regulate trolley speed.

All components of the crane were carefully tested in KSC's Malfunction Laboratory and only the metadyne and the relays exhibited abnormal results. During the course of the investigation, the board found that the cleaning process for the metadyne left a residue that could have caused the unexpected movement. Also, laboratory tests of the relay controls demonstrated unwanted resistance changes. Consequently, to improve crane reliability and reduce risk, the metadynes have been replaced and the cleaning process has been changed. In addition, operating rules regarding speed selection have been refined. As recommended by the board, the metadynes on all VAB cranes are being replaced with new solid state control systems. Officials are also investigating the continued use of the present control relays. This incident did not cause any injuries to personnel or damage to hardware or facilities.

Assisting Smith on the investigation were board members: **David Kelley**, Chief, Structural System Branch, Ground Engineering Directorate; **Howard Meeks**, Systems Engineering Section, Payload Operations Directorate; **Ronald Eatman** of the Project Engineering Staff, Facilities Engineering Directorate; **James Myers**, Systems Assurance Office, Mission Assurance Directorate; **Arthur Clark**, Cables and Special Power Section, Facilities Engineering Directorate; and **Todd Steinrock**, Mechanical Section, Facilities Directorate. **Malcolm Glenn** served as the safety advisor, **John Biedenharn** provided legal assistance and **Lisa Malone** was the public affairs representative. Board functions include investigating the facts surrounding the mishap, determining the probable cause, assessing the possibility of a recurrence or similar mishap and recommending corrective action. [KSC Release No. 158-92, Nov. 18, 1992; Banke, FLORIDA TODAY, p. 4A, Nov. 18, 1992.]

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SPEEGLE WINS KSC CONTRACT

Speegle Construction, Inc. (Cocoa, FL) has been awarded a \$197,000 fixed price contract to replace portions of the roof of the Operations and Checkout (O & C) Building at Kennedy Space Center. The small business firm began work on the contract October 26, 1992, and is required to complete this effort by April 24, 1993. This contract is for the Phase II and Phase III segments of the project to replace the entire O & C roof, which covers more than 220,000 square feet. The O & C Building, constructed in 1965 to support the Apollo program, houses astronaut crew quarters, clean room facilities and a high bay area where horizontal Space Shuttle payloads, primarily Spacelab modules, are processed. Some recent Spacelab missions include Spacelab-J in September 1992 and the U.S. Microgravity Laboratory in June of this year. [KSC Release No. 152-92, Nov. 18, 1992.]

November 19:

DISCOVERY: FRR UNDERWAY

The flight readiness review for STS 53, Discovery's next mission, is underway today at Kennedy Space Center. Technicians at Launch Complex 39A have finished loading propellants for OMS, RCS, APUs and HPUs. Work in progress: checkout of solid rocket booster thrust vector control systems; payload transfer into payload bay; installation of contingency EVA space suits; Orbiter aft closeouts and leak checks of the Orbiter mid-body umbilical (OMBU). STS 53 is expected to begin in the first week of December and land a week later at Kennedy Space Center. [SPACE SHUTTLE STATUS REPORT, Nov. 19, 1992.]

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STS 53 TO LAUNCH DEC. 2

Managers here today officially targeted December 2 for launch the Space Shuttle Discovery on its 15th mission. The decision was made at the conclusion of today's STS 53 flight readiness review at NASA's Kennedy Space Center. The launch window opens at 6:59 a.m. EST. The primary payload for this ninth dedicated Department of Defense (DoD) mission is designated DoD-1 and is classified. Although there will be no public discussion of the identify or purpose of DoD-1 operations before, during or after the mission, a number of secondary experiments in the cargo bay and in Discovery's cabin will be conducted openly throughout the planned 7-day, 5-hour flight. Commanding this 53rd Space Shuttle mission aboard the newly refurbished Discovery will be 48-year-old Navy Captain David M. Walker, making his third Shuttle flight. Sitting in the right seat will be Pilot Robert D. Cabana, 43, a Marine Colonel making his second flight. Three mission specialists will round out the five-man STS 53 crew: Air Force Colonel Guion S. Bluford, 50, making his fourth flight; and two Army Lt. Colonels - James S. Voss, 43, making his second flight, and Michael R. U. Clifford, 40, flying into space for the first time. [KSC Release No: N92-99, Nov. 19, 1992; Halvorson, FLORIDA TODAY, p. 11A, Nov. 20, 1992.]

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WHITE HOUSE REPORT: REPLACE SHUTTLES

A White House report, created by the Vice President's Space Policy Advisory Board, has recommended that "the Air Force build a new launch vehicle to serve the nation's spacelift needs and replace the Space Shuttle by 2005." An author of the report, former Air Force Secretary Edward C. "Pete" Aldridge said, "Spacelifter is the best answer from the taxpayers' point of view." Aldridge pointed out that Shuttles cost \$5 billion annually. NASA managers at Kennedy Space Center declined to comment. NASA Administrator Daniel S. Goldin said regarding the report, "That Shuttle program is the No. 1 priority for NASA. It is our only means of human access to space for the next decade and a half. There is no stepping away from that. That is chiseled in granite. That's very important for the folks down there [Kennedy Space Center] to know." [Banke, FLORIDA TODAY, p. 1A, Nov. 20, 1992; Holton, THE ORLANDO SENTINEL, p. A-14, Nov. 20, 1992.]

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SECOND LAUNCH TRY FOR DELTA 2

The Air Force will try for a second time to launch its Delta 2 rocket this weekend. The first effort, on November 5, was unsuccessful when the first stage engine did not ignite. Air Force officials continue to study the abort and have drawn no firm conclusions as to its cause. The Navstar Global Positioning System satellite, the Delta's payload, was not damaged in the failed attempt to launch. ["Delta 2 That Failed to Launch Might Try Again On Saturday," FLORIDA TODAY, p. 11A, Nov. 20, 1992.]

November 20:

DISCOVERY: PAYLOAD INSTALLED

At Launch Complex 39A where technicians have installed the classified DoD payload into Discovery's cargo bay, preparations for the launch of STS 53 continue without incident. Avionics bay closeouts have been completed as has the Orbiter aft confidence test and a disconnect/closeout of APU #1 fuel pump inlet pressure transducer. Work in progress today: aft main engine compartment closeouts; main propulsion system insulation foaming; solid rocket booster closeouts; changeout of #1 data display unit; payload interface verification test; and OMBU leak checks. Scheduled work: final ordnance work November 22; OMS/RCS fuel tank pressurization also on the 22nd; loading mass memory units November 23 and external tank purges on November 24. At present there are no

issues of concern for launch managers. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 20, 1992.]

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ENDEAVOUR: STS 54 PROCESSING

A number of processing activities leading to Endeavour's STS 54 mission have been completed while the Orbiter is in OPF Bay 1: TDRS fueling at Launch Complex 39B; aft compartment closeouts; crew compartment closeouts; external tank door functional test; Orbiter structural leak check; aft compartment leak check; right nose wheel changeout; nose wheel steering retest; payload airborne support equipment interface verification test; DXS interface verification test. Work in progress: weight and center of gravity determination and mating to Orbiter transporter. Scheduled work includes: rollover to the Vehicle Assembly Building transfer aisle November 21; attaching lifting sling and Orbiter lifting preparations that night; mating to external tank and solid rocket booster stack November 22. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 20, 1992.]

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STS 55: COLUMBIA PROCESSING ACTIVITIES

Columbia's three main engines and the forward reaction control system have been removed; window #1 has been removed and replaced. Technicians have completed payload bay deconfiguration and Orbiter structural inspections. Work in progress: powered-up Orbiter systems electrical testing; freon closed-loop coolant system modifications; X-ray reaction control system bellows; OMS/RCS pressure decay test; tile repairs; installation of payload bay liners and stacking of the left-hand solid rocket booster in the VAB's High Bay 3. Scheduled activities include: configuration of the payload bay for Spacelab-D2; tile post-flight inspections; tile repair; chin panel rework and auxiliary power unit leak and functional checks. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 20, 1992.]

November 22:

DELTA LAUNCH SUCCESSFUL

Tonight at Cape Canaveral Air Force Station's LC 17A the Air Force successfully launched its Delta 2 rocket. The vehicle carried a military satellite which will be used to guide troops on missions around the world. Two previous attempts to launch were scrubbed; the first due to bad weather and the second because of a technical problem in the rocket's first stage main engine. The satellite became part of the Navstar Global Positioning System. [Banke FLORIDA TODAY, p. 1A, Nov. 21, 1992; Banke, FLORIDA TODAY, p. 1A, Nov. 22, 1992; Halvorson and Banke, FLORIDA TODAY, p. 1A, Nov. 23, 1992.]

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KSC PROJECTS ON HOLD

Plans to construct a 24,000-square foot high bay to process new, more powerful, Shuttle boosters have been shelved for the time being; there have been delays in developing the new booster. "We're the last set of facilities in line on ASRM [Advanced Solid Rocket Motors] projects," said James Towles, KSC Facilities Director. Money for the Kennedy Space Center project is expected to be in the 1994 budget. The new boosters will have three instead of four segments and will be too big to be processed in current facilities. [Brown, FLORIDA TODAY, p. 10E, Nov. 22, 1992.]

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OPEN HOUSE AT KSC

More than 32,000 people took advantage of the opportunity to tour Kennedy Space Center during Open House this past weekend. "This is a real treat," said Jan Brown (Melbourne, FL). "You see this on TV and read about it in the newspaper, but it's even more exciting to see a real spaceship in person." [Banke, FLORIDA TODAY, p. 2A, Nov. 22, 1992.]

November 23:

DISCOVERY'S COMPUTERS TO BE LOADED

On KSC's to-do list today is a procedure to load Discovery's onboard computers with the programs necessary to fly the Discovery during its STS 53 mission which is currently slated to begin with a December 2 launch from Launch Complex 39A. Discovery has five general purpose computers and two mass memory units which house all the Shuttle's programs. [Banke, FLORIDA TODAY, p. 4A, Nov. 23, 1992.]

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STS 53: ORDNANCE OPERATIONS FINISHED

At Launch Complex 39A, technicians have completed final ordnance operations upon Discovery prior to its December 4 launch on its STS 53 mission. Technicians also completed OMS/RCS tank pressurization and the changeout of DDU #1. Work in progress today: auxiliary power unit tank pressurization and closeouts; loading mass memory units (MMU); main engine sensor calibrations; aft main engine compartment closeouts; solid rocket booster closeouts; payload closeouts. Scheduled work includes: external tank purges; closing the payload bay doors; retesting the Data Display Unit #1; orbiter aft systems confidence test and picking up the countdown at 11 a.m. on November 29. Due to the Thanksgiving holidays on November 26 and 27, no work is scheduled for the launch team. November 28 is a contingency day for any catch-up or unscheduled work. [SPACE SHUTTLE STATUS REPORT, Nov. 23, 1992.]

November 24:

DISCOVERY: STS 53 MMU'S LOADED

The main memory units (MMUs) of Discovery at Launch Complex 39A have been loaded with flight software. Main engine sensor calibrations have been completed as have auxiliary power unit tank pressurization and closeouts. Work in progress: launch countdown preparations in LCC Firing Room 1; external tank purges; crew compartment closeouts; aft main engine compartment cleaning and closeouts; solid rocket booster closeouts; closing of payload bay doors; DDU #1 retest. Work scheduled: Orbiter aft systems confidence test; installation of aft compartment flight doors. The countdown for STS 53 will be picked up at 11 a.m. November 29 for launch on December 2. Aft compartment closeout activity today and tomorrow includes documentation photographs and the removal of access platforms, supplemental lighting, communications gear, and protective caps and covers. [SPACE SHUTTLE STATUS REPORT, Nov. 24, 1992.]

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DISCOVERY: MAIN ENGINE CONTROLLER OK'D

A main engine controller aboard Discovery experienced a minor problem after activation today; it was tested for about 16 hours subsequently and mission managers feel confident that the computer will operate properly for flight. Nevertheless, managers will conduct a retest of the controller on November 30. Similar problems have surfaced before other flights. [Banke, FLORIDA TODAY, p. 1A, Nov. 25, 1992.]

November 25:

DISCOVERY: PRESSURE DECAY

An extra three hours of hold-time will be added into the launch countdown at the T-19 hour mark to give managers extra time to examine a slight pressure decay that could be in ground support equipment or in the oxygen side of the power reactant storage and distribution system. Officials want the extra time to evaluate the situation following the holiday period. Discovery's payload bay doors were closed for flight at 3:45 p.m. yesterday; the external tank has been purged in preparation for fueling at Launch Complex 39A. Work in progress today for the STS 53 mission: closeouts of the aft engine compartment; launch countdown preparations; preparing the crew compartment for flight; solid rocket booster closeouts; moving the booster flame deflectors to the launch position. Scheduled work activities: bolting the doors on the aft compartment for flight; powering down the vehicle; beginning the launch countdown at 8 a.m. November 29; arrival of the crew at the SLF at 1 p.m. November 29; launch December 2 at 6:59 a.m. EST. Kennedy Space Center workers will have off Thursday and Friday for the Thanksgiving holiday. A number of employees will work November 28 to prepare for the start of the launch countdown and the STS 53 launch team will be at stations beginning with the countdown's commencement on November 29. [SPACE SHUTTLE STATUS REPORT, Nov. 25, 1992; Banke, FLORIDA TODAY, p. 9A, Nov. 26, 1992.]

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STS 54: ELEMENTS MATED

In the Vehicle Assembly Building, Endeavour has been mated with its external tank and solid rocket boosters. Workers are closing out the electrical connections between the Orbiter and external tank in preparation for rollout to Launch Complex 39B on December 3. Preparations are also underway to power up the vehicle for the shuttle interface test scheduled for December 1. Endeavour's third mission, STS 54, will begin after the first of the year. [SPACE SHUTTLE STATUS REPORT, Nov. 25, 1992.]

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COLUMBIA: STS 55 PROCESSING

Columbia, the senior member of NASA's Space Shuttle fleet, is currently in OPF Bay 2 at Kennedy Space Center where the Orbiter is having a drag chute installed. Technicians are X-raying the orbital maneuvering system pods; purging the freon cooling system; conducting leak and functional tests of the auxiliary power units and inspecting the vehicle's hydraulic system. Columbia's STS 55 mission will be the second flight of 1993. [SPACE SHUTTLE STATUS REPORT, Nov. 25, 1992.]

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BEACH CLOSED UNTIL MID-JANUARY

Playalinda Beach will be closed to visitors from November 29 through mid-January due to Space Shuttle operations. Space Shuttle Discovery is scheduled to be launched from LC 39A on Mission STS 53 at 6:59 a.m. EST, December 2, 1992. The beach closing is required three days prior to a Space Shuttle launch from 39A, which necessitates closing on November 29. On December 3, the Space Shuttle Endeavour will be rolled out to Launch Complex 39B in preparation for the STS 54 January 1993 launch. Pad 39B is KSC's northernmost pad and requires the beach be closed whenever a Shuttle is present there. [NASA/KSC News Release No. 160-92, Nov. 25, 1992; "Playalinda Beach To Close," FLORIDA TODAY, Nov. 27, 1992.]

November 27:

PRESSURE LOSS PROVOKES TESTS

A problem with ground support equipment at Launch Complex 39A has causing NASA to decide to conduct some tests today, rather than tomorrow; an unwanted drop in pressure in a liquid oxygen line was noted at the pad today. KSC spokesman Karl Kristofferson said the problem was not with Discovery or any of its flight hardware. "Neither of those operations [the tests] are expected to delay Wednesday's scheduled launch of Discovery at 6:59 a.m.," said Kristofferson. Meanwhile, workers will either repair or replace a seal within a liquid hydrogen storage tank aboard Discovery. [Banke, FLORIDA TODAY, p. 8A, Nov. 28, 1992.]

November 29:

STS 53: COUNTDOWN STARTS TODAY

At 8 o'clock this morning the countdown clock will start at Kennedy Space Center for the STS 53 mission of Discovery. The five-man crew of this Department of Defense mission includes: Commander David M. Walker, Pilot Robert D. Cabana and Mission Specialists: Guion S. Bluford, Michael R. U. Clifford and James S. Voss. Weather appears to be the prime concern for launch at present. A plan to land the Orbiter with a computer at the controls has been canceled. [Banke, FLORIDA TODAY, p. 1A, Nov. 29, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-11, Nov. 29, 1992; See Crew Profiles in FLORIDA TODAY, p. 9E, Nov. 29, 1992; "Countdown for Discovery's Wednesday Launch Begins," THE ORLANDO SENTINEL, Nov. 30, 1992.]

November 30:

STS 53: WEATHER 60% UNFAVORABLE

The weather forecast for December 2 calls for a 60% chance of violating the weather rule prohibiting launch if there is a steady-state wind below 5 knots with a temperature of less than 47 degrees for longer than 30 consecutive minutes. Meanwhile, KSC technicians have completed a number of tasks concerning preparations to launch Discovery on its STS 53 mission: Orbiter potable water sampling; crew arrival; crew medical exams and flight suit check this morning and commander and pilot Shuttle Training Aircraft (STA) flights this afternoon. Work in progress: launch countdown in LCC Firing Room 1; loading fuel cell cryogenic reactants; activating Orbiter navigation system; troubleshooting pyrotechnic initiator cable on left-hand booster holddown post; preparations to retract rotating service structure. Work scheduled: remove and replace holddown indicator cable this afternoon; retest holddown post indicator cable tomorrow; retract Orbiter midbody umbilical (OMBU) tonight; training flights for astronauts tomorrow; retraction of rotating service structure for launch at 11 a.m. December 1. [Banke, FLORIDA TODAY, pp. 10E & 9E, Nov. 29, 1992; SPACE SHUTTLE STATUS REPORT, Nov. 30, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, Dec. 1, 1992.]

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LAUNCH WEATHER RULES DISCUSSED

NASA managers are meeting today to discuss Discovery's STS 53 countdown and the chilly weather forecast for launch day. "Their big concern will be the temperatures and the temperature-wind relationship," according to Shuttle Weather Officer Ed Prisela of the 45th Space Wing. By contrast to the procedure in use at the time of the 1986 Challenger accident, heaters installed around the main booster joints keep seals properly conditioned during every countdown. [Banke, FLORIDA TODAY, pp. 1A-2A, Nov. 30, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Dec. 1, 1992.]

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STS 53 CREW ARRIVES

"It's good to be back in Florida. We hope we don't stay here very long," said STS 53 Commander **David M. Walker** upon his arrival with his crewmates today at the Shuttle Landing Facility. Walker added, "We're planning to go up as quickly as the airplane's ready, and we think that's going to be Wednesday. Everything we're hearing about the condition of the Orbiter says it's ready to go. We're ready to go, and we're looking forward to a good mission." Meteorologists currently estimate a 50 percent chance of acceptable weather for launch between 6:59 and 9:29 a.m. on December 2. [Banke, FLORIDA TODAY, p. 1A, Nov. 30, 1992.]

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KSC AWARDS BRIDGE CONTROLS CONTRACT

Military Construction Corp. (Merritt Island, FL) has been awarded a \$1,089,000 fixed price contract to replace the electrical control systems of the four drawbridges at Kennedy Space Center. Work under this contract is scheduled to begin in February 1993 and must be completed by June 1994. The contract calls for the small business firm to replace operator controls in the control houses of the Indian River bridge on NASA Causeway West, the Banana River bridge on NASA Causeway East, the Haulover Canal bridge on Kennedy Parkway North and the JJ Railroad bridge north of Titusville (FL). The existing controls are original equipment installed when the bridges were constructed in the early 1960's and are considered to be obsolete. The new operating systems will include computerized control of the bridge mechanical systems. Primary advantages of the new systems over the existing equipment are less operator involvement, a higher degree of reliability and reduced maintenance costs. [KSC Release No. 159-92, Nov. 30, 1992.]

DECEMBER

December 1:

DISCOVERY: LOADING PROPELLANTS

Today at Launch Complex 39A workers removed and replaced the left booster holddown post pyro initiator cable. They loaded cryogenic reactants into Discovery and activated the Orbiter's navigation and communications system. As part of the final preparations for the STS 53 launch tomorrow, they retracted the Orbiter midbody umbilical (OMBU). Final astronaut medical examinations were conducted as well as a flight suit fit check. Work in progress: launch countdown in the Launch Control Center's Firing Room 1; troubleshooting the Orbiter Electronics Interface Unit (EIU); astronaut T-38 training flights; astronaut status briefings on countdown, Discovery, payload; retracting rotating service structure; loading the Space Tissue Loss experiment; configuring cockpit switches for launch; activation of Orbiter fuel cells. A re-test of the left booster holddown post pyrotechnic initiator cable is scheduled. [SPACE SHUTTLE STATUS REPORT, Dec. 1, 1992.]

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SPACE STATION MANAGEMENT CHANGES

Culminating 6 months of reviews, NASA today announced plans to consolidate some management functions for the Space Station Freedom program and create a contractor-led integration team to ensure the successful building and deployment of the international space station. "These moves will improve overall program management and significantly strengthen the integration of the various station elements," said Arnold Aldrich, Associate Administrator for Space Systems Development. "We foresee no schedule or budgetary impact from these changes. In fact, when fully implemented, these changes will reduce 'overhead' costs and strengthen program execution and accountability."

NASA plans to combine the existing Level 1 (Headquarters) and Level II (Reston) Space Station Freedom offices in Reston, VA. This step will consolidate overall program management at Reston. "Reston will remain the focal point for the space station program for the foreseeable future," said Aldrich. NASA is working toward establishing a Joint Vehicle Integration Team (JVIT) at the Johnson Space Center (Houston, TX). The JVIT will be staffed by the 3 space station prime contractors (Boeing, McDonnell Douglas and Rocketdyne). NASA will manage the JVIT contract.

"It is my strong view, which is shared across NASA senior management, that these changes are essential to the successful implementation of this program," said Aldrich. "Further, they are consistent with the findings of a number of internal NASA reviews and with congressional direction. The changes are fully supported by the space station hardware contractors and by Grumman." Grumman is the space station engineering and integration contractor who will participate with the JVIT and who will continue at Reston as the program integration contractor. Aldrich said, "With these changes, the civil service manpower level at Reston will likely increase above the current level of about 210." Aldrich said Richard Kohrs will continue as Director, Space Station Freedom and will be located at Reston. He added that the Deputy Director for Program and Operations would be transitioned to the Johnson Space Station to provide for full and effective management of the Freedom program, including the JVIT.

According to Aldrich, details of these changes will be spelled out in a transition plan developed by Kohrs in mid-February 1993. The plan will clearly define the roles and responsibilities for the space station offices at Reston; the Lewis Research Center

(Cleveland, OH); the Johnson Space Center; the Marshall Space Flight Center (Huntsville, AL); and the Kennedy Space Center, FL. Kohrs plan also will address the longer-range plans to consolidate Space Shuttle and Space Station operations by mid-1997 and combine the Shuttle and Station programs by late 1999. "This will result in significant economies of scale in the outyear budget for Space Station operations and will greatly improve the overall operations management of both programs," said Aldrich.

"Over the course of the last few years, the men and women of the NASA team have made substantial progress in meeting key program milestones," Aldrich said. "However, as the program shifts its emphasis from design activities to hardware development, manufacturing and integration, the buildup to support these activities at the NASA Centers was planned and is required." Aldrich said these changes have been reviewed with the Office of Management and Budget and the Congress and will be presented to the President-Elect's transition team in the near future. [NASA Release: 92-214, Dec. 1, 1992; Halvorson, FLORIDA TODAY, p. 2A, Dec. 16, 1992.]

December 2:

DISCOVERY: STATUS REPORT

Discovery was launched upon its STS 53 mission today at 8:24 EST; the launch was delayed 85 minutes because of cool weather at the launch pad which caused icing on the external tank. The prime payload - DoD-1 - was deployed about six hours after launch and the crew and Shuttle Orbiter remain in good condition. Landing is planned for December 9 at the Kennedy Space Center Shuttle Landing Facility after completion of its six-day flight. [Date, THE ORLANDO SENTINEL, pp. A-1 & A-8, Dec. 3, 1992; SPACE SHUTTLE STATUS REPORT, Dec. 3, 1992; Halvorson, FLORIDA TODAY, p. 1A, Dec. 2, 1992.]

December 3:

ENDEAVOUR ROLL OUT

Today, Endeavour is being moved from the Vehicle Assembly Building to Launch Complex 39B; first motion occurred at 7:14 a.m. EST. The vehicle was expected to arrive at the pad by early afternoon and the rotating service structure will be deployed around the Orbiter by 5:30 p.m. today. "We're certainly not wasting any time getting the next one ready to go. We wanted to get it out to the pad as soon as we could and get as much work done as possible before we break for the holidays," said Kennedy Space Center spokesman Bruce Buckingham. Work scheduled: hook-up of ground support equipment and checkouts of systems between the mobile launch platform, the vehicle and the ground. Installation of the TDRS-F spacecraft into Endeavour's payload bay is scheduled to occur December 4, beginning at 6 a.m. The task is expected to be completed by midnight. Connections and checkouts between the Orbiter and satellite will occur throughout the weekend. Endeavour's terminal countdown demonstration test is set for December 16. [SPACE SHUTTLE STATUS REPORT, Dec. 3, 1992; Banke, FLORIDA TODAY, p. 4A, Dec. 3, 1992; Halvorson, FLORIDA TODAY, p. 6A, Dec. 4, 1992.]

December 4:

BOC CONTRACT PROTESTS

NASA has been informed by the General Services Board of Contract Appeals and the General Accounting Office that all three losing contenders for the Kennedy Space Center Base Operations Contract (BOC) have filed protests over the selection of Lockheed Space Operations Co. for negotiations on the contract. The selection was made November 18. The BOC will be a cost-plus-award fee contract with incentive fee features covering an initial period of four years, with three priced 2-year options for a total potential period of

10 years and value of approximately \$1.9 billion. For the past 10 years the contract has been held by EG&G Florida, Inc. EG&G Florida General Manager **James Dubay** said, "We are pleased to hear of NASA's plans to extend the base operations contract with EG&G Florida long enough for resolution of the protests." Approximately 3,000 persons are employed by EG&G for work on the BOC.

BAMSI, Inc. (Titusville, FL) and EG&G Florida, Inc. have filed their protests with the General Services Board of Contract Appeals. Westinghouse Electric Corporation's Government Operations Business Unit (Pittsburgh, PA) has filed its protest with the General Accounting Office. As a result, KSC is planning to extend the present contract with EG&G Florida long enough to allow for resolution of the protests and an orderly transition to the new contractor. It is expected that the protests will be resolved by mid-February. "The extension will cover the resolution of the protests," according to **Wes Dean**, Chief of Procurement. Lockheed Space Operations Co. spokesman **J. B. Klump** said, "Considering that a review is under way, it is not appropriate to respond at this time." Lockheed, already the Shuttle Processing Contractor, employs about 7800 people. [Boylan, FLORIDA TODAY, p. 14C, Dec. 3, 1992; KSC Release: 166-92; Dec. 4, 1992; Liden, FLORIDA TODAY, p. 1A, Dec. 5, 1992; Liden, FLORIDA TODAY, pp. 1A-2A, Dec. 23, 1992.]

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ENDEAVOUR: PAD VALIDATIONS

Endeavour has been transferred from the Vehicle Assembly Building to Launch Complex 39B; the rotating service structure has been deployed around the Orbiter and the vehicle has been powered up. The payload bay and crew module doors have been opened and the TDRS/IUS covers have been removed. Work in progress today: installation of TDRS (manufactured by TRW) into the Orbiter payload bay; launch pad validations; gaining access to the aft engine compartment; preparations for prelaunch hypergolic propellant loads; main engine leak checks. Scheduled work: TDRS/Orbiter integration verification test and the helium signature leak test. Kennedy Space Center spokesman **Bruce Buckingham** said, "We're in good shape. The first mission of the new year should be processed without any problems." [SPACE SHUTTLE STATUS REPORT, Dec. 4, 1992; Halvorson, FLORIDA TODAY, p. 5A, Dec. 5, 1992.]

December 5:

USBI: EMPLOYEES OF THE MONTH

United Technologies USBI has announced three employees of the month awards: **Patricia Ovington** was named September employee of the month; **Robert Church** and **Andrew Bradley** were named for October and November, respectively. USBI is a prime contractor working at Kennedy Space Center to assemble and refurbish Space Shuttle solid rocket boosters. ["USBI Announces Employees of Month," FLORIDA TODAY, p. 9E, Dec. 6, 1992.]

December 7:

ASRM TRANSPORTERS ARRIVE AT KSC

The first major items of ground support equipment for the Advanced Solid Rocket Motor (ASRM) arrived at the Kennedy Space Center yesterday by barge. Called Kneel-Down Transporters (KDTs), they are special-purpose trucks designed to carry ASRM segments when loaded on special transportation pallets. Each segment with pallet weighs 795,000 pounds. The two KDTs are the first of four transporters that have been ordered from KAMAG Transportation Company of Germany. These transporters will eventually be taken to the Yellow Creek, Mississippi, manufacturing site for the ASRM when these facilities are

complete. The cost of the first set of transporters is \$5.8 million dollars. Two more identical KDTs will be delivered later for use at KSC and will cost somewhat less money.

The term "kneel down transporter" refers both to the action of the transporter in kneeling down to pick up the pallets, as well as the configuration of a wheel set, or "bogie." Looking at individual bogie, one can see that its supporting leg does indeed have a pivot point like a knee—hence the term kneel down transporter. The mission of the transporter includes several tasks:

- *move the filled and unfilled motor segments during the manufacturing process at Yellow Creek, Mississippi.

- *load the completed rocket segments onto the barge at Yellow Creek for transportation to Kennedy Space Center, Stennis Space Center (Bay St. Louis, MS) or Marshall Space Flight Center (Huntsville, AL).

- *unload the rocket motor segments from the barge at KSC for transportation to and between ordnance storage facilities and the Vehicle Assembly Building.

The transporter can also be configured for a variety of other general purpose applications. A 600-horsepower diesel engine furnishes the primary power for the transporter and its associated electrical and hydraulic systems. The transporter provides precision speed control ranging from creep to a maximum of ten miles per hour. The transporter is highly maneuverable, having a turning radius of only 30 feet. The front and rear bogies pivot at different angles about the two center rows of bogies, which are fixed. Combined with the precision speed control, this maneuverability allows the operator to position the transporter precisely under the load. An operator from KAMAG arrived with the first two transporters to drive them off the barge to their storage area which is north of the Vehicle Assembly Building. He will then assist in training the drivers who are to be furnished by the KSC Shuttle Processing contractor, Lockheed Space Operations Co. [KSC Release No. 165-92, Dec. 7, 1992.]

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GROUNDBREAKING: SPACE EDUCATION CENTER

The Astronauts Memorial Foundation (AMF) board members, families of deceased astronauts and invited guests will join together in breaking ground for the new Center for Space Education at 10 a.m. on Thursday, December 10, at the construction site on the northwest side of KSC's Spaceport USA visitors center. Planned as a "living memorial" to U.S. astronauts who have given their lives in the line of duty, the new 44,000-square-foot education facility will provide a large area for educational materials to further students' knowledge and interests in space, science and aeronautics. NASA educational activities and teacher resources services, currently located at the visitors center, will be moved into the new building which is expected to be completed by 1994.

Grace Corrigan, mother of 51-L teacher in space Christa McAuliffe, will be the keynote speaker at the event. KSC Center Director Robert L. Crippen, Chairman of the AMF board of directors Alan Helman and AMF President James DeSantis are also scheduled to speak. The theme of the event is "youth" and the Merritt Island High School Band will perform for the invited guests which include former Gemini and Apollo astronaut James Lovell and relatives of deceased astronauts Roger Chaffee, Ed White, Elliot See, Jr. and Gregory Jarvis. In addition, the Satellite High School Air Force Junior ROTC will present

the colors. [KSC Release No. 168-92, Dec. 7, 1992; Banke, FLORIDA TODAY, p. 1A, Dec. 10, 1992; Banke, FLORIDA TODAY, Dec. 11, 1992.]

December 8:

LANDING DELAY PROBABLE

Kennedy Space Center officials who have an eye on the weather are planning to extend Discovery's Department of Defense STS 53 mission. Commander David M. Walker said December 7, "We haven't run out of food yet, so we're in no hurry. Forecasters predict cloudy skies for Brevard's Wednesday afternoon and the prospects are 'definitely bad' at Edwards Air Force Base, CA, and at the Northrup Strip (White Sands, NM). NASA Flight Director Milt Heflin said, "Right now we plan to land at KSC on Wednesday." The initial KSC landing opportunity (at 2:16 p.m. EST) will require a deorbit burn at 1:11 p.m. EST. A second landing opportunity occurs at 3:50 p.m. EST. Some NASA officials think the upcoming landing at KSC will present an opportunity to study how the vehicle performs in runway crosswinds. [Banke, FLORIDA TODAY, p. 1A, Dec. 8, 1992; Banke, FLORIDA TODAY, p. 1A, Dec. 9, 1992; Date, THE ORLANDO SENTINEL, Dec. 9, 1992.]

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WONG/WILLIAMS AWARDED SNOOPYS

Titusville residents Sharon Wong and Edward Williams have been awarded Silver Snoopys. Wong, who works in the Payload Management and Operations Directorate, was cited for her efforts to interest women and minorities in engineering and space through the KSC mentor program. Williams, a Senior Quality Engineer, was cited for work in resolution of complex quality issues concerning Shuttle hardware processing. [Scott, STAR-ADVOCATE, Dec. 9, 1992.]

December 9:

DISCOVERY LANDS AT EDWARDS: LEAKS

Discovery landed this afternoon at Edwards Air Force Base (CA) at 3:43 EST; shortly afterward ground crews detected seepage of nitrogen tetroxide propellant. The leak kept the crew inside the Orbiter for more than two hours. Capcom Kenneth S. Reightler Jr., himself an astronaut, said to the crew from Houston, "One thing is for sure, you will not get to walk around and kick the tires after you egress. Mission Commander David M. Walker replied, "It is a big disappointment if we have to wear the helmets and don't get to use the slide." The fumes of toxic gas were dispersed by a large fan and the astronauts left the vehicle in the usual manner - a portable staircase. Discovery's mission was the eighth and last of 1992. Kennedy Space Center Director Robert L. Crippen said, "We ended up having about as successful a year as I can have possibly wished for back a year ago when I first showed up at KSC as center director. This mission just kind of topped it off. Of course, we have to get [Discovery] home from Edwards, but we know how to take care of that." The next Shuttle mission is Endeavour's STS 54 flight which is tentatively scheduled to launch from KSC on January 13, 1993. [Banke and Halvorson, FLORIDA TODAY, pp. 1A-2A, Dec. 10, 1992; "Discovery's Return," THE ORLANDO SENTINEL, p. A-1 and on A-4, Dec. 9, 1992.]

December 10:

CRIPPEN TO BRIEF BREVARD LEADERS

Business executives and elected officials throughout Brevard County will be briefed on current KSC programs and plans, then space center's economic impact on the area, and the status of Space Station Freedom. The briefing is set to begin at 9:00 a.m., December 15, 1992, in the Galaxy Theater at Spaceport USA. Center Director Robert L. Crippen will

provide the group with a review of KSC's 1992 activities and an overview of near-term plans and how they relate to Brevard County. Crippen will respond to questions following his remarks. Space Station Project Manager at Kennedy Space Center John R. Lyon will brief attendees on the overall progress of the Space Station Freedom program and its impact on the local area. [Notice to Editors/News Directors, KSC Release No. 170-92, Dec. 10, 1992.]

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KSC: MCDONNELL DOUGLAS EXTENDED

Kennedy Space Center has awarded McDonnell Douglas Space Systems Co. (Kennedy Space Center Division) a three-year extension of its existing contract for payload ground operations services, valued at approximately \$561.4 million. The extension, effective January 1, 1993, through December 31, 1995, brings the cumulative value of the contract to \$1.2 billion. This is the second extension of the payload ground operations contract awarded to McDonnell Douglas in January 1987. Under the cost-plus-award-fee extension, McDonnell Douglas will continue to provide ground support, test and integration for payload operations at Kennedy Space Center. [Release: C92-21, Dec. 10, 1992; "McDonnell Douglas Wins NASA Extension," FLORIDA TODAY, Dec. 12, 1992.]

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REPLACEMENT OF FAULTY SENSORS

NASA is replacing engine sensors which were produced in the same group as the ones which failed in two of the last three Shuttle missions, according to Boyce Mix who is Deputy Manager of the Space Shuttle Main Engine program at Marshall Space Flight Center (Huntsville, AL). "Both of these [sensor failures] were of a particular lot number." When faulty readings are sent to the engine computer, the information is ignored. "We think that the pump is more reliable than the sensor," added Mix. [Date, THE ORLANDO SENTINEL, p. A-4, Dec. 11, 1992.]

December 11:

STS 54: ENDEAVOUR AT LC 39B

Pre-launch hypergolic propellant loads into Endeavour have been completed at LC 39B; the TDRS/Orbiter integration verification test of the STS 54 payload is finished and the pad is open again for normal work activities as of 10 p.m. last night. Work in progress: securing heaters for the Orbital Maneuvering system and reaction control system for powerdown this weekend; preparations for the upcoming terminal countdown demonstration test and for auxiliary power unit leak checks. Scheduled activities: terminal countdown demonstration test next week; crew arrival and PAO session at LC 39B; opening of payload bay doors; launch readiness review; flight readiness review; TDRS/IUS end-to-end test; IUS flight readiness checks. [KSC Space Shuttle Status Report, Dec. 11, 1992.]

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DISCOVERY: LEAK DELAYS RETURN TO KSC

Discovery remains in the mate-demate device at the Dryden Flight Research Center following its landing at 3:43 p.m. EST, December 9. The vehicle has been jacked and leveled and operations are continuing to prepare it for ferry flight beginning December 15. Discovery is slated for a two-day cross-country flight atop the modified 747 Shuttle Carrier Aircraft. If weather allows, arrival is targeted for mid-afternoon December 16, 1992. [Banke, FLORIDA TODAY, Dec. 8, 1992; Banke, FLORIDA TODAY, Dec. 11, 1992; Date, THE ORLANDO SENTINEL, P. A-18, Dec. 10, 1992; KSC Space Shuttle Status Report, Dec. 11, 1992.]

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COLUMBIA: IN OPF BAY 2

Processing activities for Columbia's STS 55 mission continue unabated in Orbiter Processing Facility Bay 2. Upcoming operations include: orbital maneuvering system functional tests; freon coolant loop servicing and tests; hydraulic system operations; landing gear functional tests; and aerosurface functional checks. Rollover to the VAB is targeted for early February. Work on the Solid Rocket Boosters is also continuing in the Vehicle Assembly Building with the right forward segment being mated today. Next week, work will commence to demate the left forward center segment; the segment has failed two low-pressure leak checks in the past week, though the leaks are believed attributable to faulty ground support equipment. However, managers have decided to destack the left forward center segment to confirm this theory. This unplanned operation is expected to have no impact on the launch of STS 55, however, it will slip the external tank mating into early 1993. [KSC Space Shuttle Status Report, Dec. 11, 1992.]

December 12:

KSC: BUSY WEEK ON TAP

Endeavour's five person crew arrive at Kennedy Space Center December 14 to take part in a terminal countdown demonstration test for STS 54. "It's essentially a dress rehearsal for launch," said KSC spokesman Bruce Buckingham. Discovery, meanwhile, is being readied for its ferry flight home to KSC from California; arrival of the Orbiter and the Shuttle Carrier Aircraft is expected to be noon, December 16. The Air Force is launching a Delta rocket at Cape Canaveral on the 16th, as well. [Halvorson, FLORIDA TODAY, p. 3A, Dec. 13, 1992.]

December 14:

STS 54: ENDEAVOUR'S PROCESSING FLOW

Technicians continue processing Endeavour for its January 1993 launch on the STS 54 mission. Work in progress today: Orbiter power is on through December 23; TDRS/IUS payload end-to-end communications test; delivery of liquid oxygen to Launch Complex 39B; Orbiter/external tank quick disconnect purges; preparations for terminal countdown demonstration test (TCDT); astronaut arrival for TCDT; astronaut M113 orientation and driver training; astronaut fit check of launch/re-entry suits. Scheduled activities: start of TCDT December 15; astronaut pad safety training; TCDT T-0 at 11 a.m. December 16; TDRS/IUS launch simulation exercise; KSC launch readiness review (LRR) and main engine flight readiness test December 17; flight readiness review (FRR) December 22. [SPACE SHUTTLE STATUS REPORT, Dec. 14, 1992.]

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DISCOVERY PREPARES FOR FERRYING

At NASA's Dryden Flight Research Facility at Edwards Air Force Base (CA), the ferry flight tail cone is being attached to Discovery. The Orbiter will be mated to the 747 Shuttle Carrier Aircraft tonight. Departure from Edwards is set for local sunrise December 15 with the arrival at KSC scheduled for noon December 16. Weather is marginal in east Texas and Louisiana which could extend the ferry flight. [SPACE SHUTTLE STATUS REPORT, Dec. 14, 1992.]

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CRF OFFICIAL OPENING

Kennedy Space Center's newest building, the Canister Rotation Facility, will be officially open after a ceremonial ribbon-cutting on Wednesday, December 16 at 1 p.m. KSC Director Robert L. Crippen; John T. Conway, Director of Payload Management and

Operations; and **George Faenza**, Vice-President/General Manager, McDonnell Douglas Space Systems Company, are among the speakers at the event. Designed to provide space for rotating the canister containing Shuttle payloads, the 7,200 square-foot facility features a 100-ton bridge crane, support stands and access platforms. Located in KSC's Industrial Area, the building is 60 ft. by 120 ft. by 141 ft. Ivey's Construction (Merritt Island, FL) designed and built this facility under contract with NASA for \$5,985,000. [Note to Editors/News Directors, KSC Release No. 171-92, Dec. 14, 1992.]

December 15:

STS 54: ENDEAVOUR AT PAD

At Launch Complex 39B, workers have completed an end-to-end communications test of the TDRS/IUS payload for Endeavour's STS 54 mission next month. A DXS compatibility test has concluded, as well. Liquid oxygen has been delivered to the pad and Orbiter/external tank quick disconnect purges are now finished. Completed astronaut training includes: M113 (pad escape vehicle) orientation and driver training and fit checks of launch/re-entry suits. Work in progress: terminal countdown demonstration test; astronaut Shuttle Training Aircraft (STA) flights; astronaut pad B emergency egress training; astronaut inspection of TDRS/IUS payload in bay; delivery of liquid hydrogen to pad storage spheres; preparation of Orbiter hydraulics for flight readiness test; calibration of inertial measurement units; solid rocket booster flight battery installation and crew cabin and aft compartment cleaning. Scheduled work: completion of TCDT; TDRS/IUS launch simulation exercise; SRB parachute camera installation; beginning of IUS flight readiness checks; KSC launch readiness review (LRR); main engine flight readiness test; installation of IUS flight batteries and flight readiness review (FRR) set for December 22. [SPACE SHUTTLE STATUS REPORT, Dec. 15, 1992.]

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DISCOVERY: FERRY FLIGHT PLANS

At Dryden's Flight Research Facility (Edwards Air Force Base, CA), mating Discovery to the 747 Shuttle Carrier Aircraft is under way. Difficulty retracting the Orbiter's landing gear has delayed departure until no earlier than 1 p.m. PST. If departure occurs today, the destination will be Biggs Army Air Field (El Paso, TX) for an overnight stop. Regardless, weather continues to be poor in east Texas and Louisiana which likely will extend the ferry flight. The arrival of Discovery at KSC is expected to occur on approximately Friday. [SPACE SHUTTLE STATUS REPORT, Dec. 15, 1992.]

□

STS 55: BOOSTER STACKING ACTIVITY

STS 55 solid rocket booster stacking activity: In the Vehicle Assembly Building, the left forward center segment was destacked yesterday and a new set of seals is being installed today. Restacking is being scheduled for December 17. While the mating of the external tank to the solid rocket booster stack has been rescheduled to occur after the Christmas holidays, there continues to be no STS 55 rollout or launch date impact. [SPACE SHUTTLE STATUS REPORT, Dec. 15, 1992.]

December 16:

PRESS TO SEE SPACELAB D-2

Spacelab D-2, primary payload of STS 55 and the second of two flights dedicated to Germany, will be displayed for the news media on Friday, December 18. KSC Payload Processing Manager **Russ Lunnan** and D-2 Deputy Mission Manager for the German Aerospace Research Establishment (DLR) **Hermann Kurscheid** will respond to questions. On January 7, Spacelab-D is slated to be transferred from the Operations & Checkout

Building High Bay to the Orbiter Processing Facility for installation inside Columbia's cargo bay. STS 55 is scheduled for a February 1993 launch with a seven person crew including two German Payload Specialists. During the nine-day flight, some 90 experiments will be conducted in the areas of astronomy, biology, materials sciences, medicine and space technology. Spacelab D-1 was flown aboard Challenger on STS 61A in 1985. [KSC Release No. 172-92, Dec. 16, 1992.]

□

STS 54 PAD PREPARATIONS FOR 93 LAUNCH

The terminal countdown demonstration test for STS 54 has been completed as has the TDRS/IUS simulation. The STS 54 crew finished its emergency egress training and inspection of the mission's prime cargo: TDRS/IUS. Liquid hydrogen has been delivered to the LC39B storage spheres and pad crews have conducted an Orbiter/external tank cavity purge leak check and prepared Orbiter hydraulics for the upcoming flight readiness test. The solid rocket booster flight batteries have been installed. Work in progress: flight readiness test of main engines and flight controls; IUS flight readiness checks; calibration of inertial measurement units; crew cabin and aft compartment cleaning; SRB parachute camera installation; avionics bay closeouts and calibration of inertial measurement units. Scheduled work includes: TACAN testing; KSC launch readiness review [December 17]; aft main engine compartment confidence test; installation of IUS flight batteries and the December 22 flight readiness review. [SPACE SHUTTLE STATUS REPORT, Dec. 16, 1992; Halvorson, FLORIDA TODAY, p. 2A, Dec. 16, 1992; Halvorson, FLORIDA TODAY, p. 5A, Dec. 17, 1992.]

□

FERRY FLIGHT CONTINUES

Discovery atop the 747 Shuttle Carrier Aircraft landed at Kelly Air Force Base (San Antonio, TX) last night at 8:14 p.m. EST. Departure is planned for tomorrow with a likely overnight stop in Mississippi and arrival at KSC on December 18. Weather conditions are unacceptable in East Texas and Louisiana for continuing the ferry flight today. [SPACE SHUTTLE STATUS REPORT, Dec. 16, 1992; Halvorson, FLORIDA TODAY, p. 5A, Dec. 16, 1992.]

December 17:

DELTA LAUNCH PROBABLE TONIGHT

The weather forecast for tonight would allow for an 80% favorable chance for launching the Air Force's Delta II carrying a NAVSTAR satellite. Technical difficulties scrubbed last night's attempt at one minute before liftoff. The launch window for tonight's attempt is between 5:08 and 5:36 p.m. [Halvorson, FLORIDA TODAY, p. 5A, Dec. 17, 1992; Halvorson, FLORIDA TODAY, p. 5A, Dec. 18, 1992.]

□

STS 54: FLIGHT READINESS TEST DONE

At Launch Complex 39B, technicians processing Endeavour for its STS 54 mission next month have completed the flight readiness test of the Orbiter's main engines and flight controls. The SRB parachute camera has been installed and the TCDT and the TDRS/IUS countdown simulations have been completed as well. Work in progress: IUS flight readiness checks; calibration of inertial measurement units; crew cabin and aft compartment cleaning; avionics bay closeout; TACAN testing and KSC launch readiness review. Scheduled tasks: aft main engine compartment confidence test; aft main engine compartment closeouts; installation of IUS flight batteries and the flight readiness review on December 22. [SPACE SHUTTLE STATUS REPORT, Dec. 17, 1992.]

□

DISCOVERY FERRY FLIGHT: THE SAGA CONTINUES

Discovery is scheduled to depart Kelly Air Force Base (San Antonio, TX) atop its Shuttle Carrier Aircraft and head for Mississippi's Columbus Air Force Base. There will be an overnight stop due to poor weather conditions in the Florida panhandle. The ferry flight is expected to complete its journey at Kennedy Space Center tomorrow. [SPACE SHUTTLE STATUS REPORT, Dec. 17, 1992.]

□

SRB ACTIVITY

In the Vehicle Assembly Building, the left booster being processed for the STS 55 mission has passed its initial leak checks, with the second set of tests underway today. Troubleshooting continues on the right booster and a decision is expected later today on whether it will be necessary to destack the right forward segment. Officials have not yet deduced the reason for the leaks in the boosters. [SPACE SHUTTLE STATUS REPORT, Dec. 17, 1992.]

December 18:

STS 54: DXS INTERIM SERVICING

At Launch Complex 39B, technicians have concluded their interim servicing of Endeavour's DXS (Diffuse X-Ray Spectrometer) payload for the STS 54 mission. Calibrations of the Inertial Measurement Unit have been concluded. The flight readiness test is complete as is the KSC launch readiness review. Work in progress: IUS flight readiness checks; IUS range safety hold fire check; IUS flight battery installation; aft main engine compartment confidence test and cleaning; crew cabin and aft compartment cleaning; avionics bay closeouts and testing of Orbiter television cameras. Scheduled work: Orbiter/external tank cavity purge reverification; ordnance installation; flight readiness review; preparations for holiday work suspension and facility outages; closing of payload bay doors for the holidays. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 18, 1992.]

□

STS 55: COLUMBIA'S PROCESSING FLOW

In OPF Bay 2, technicians working on Columbia for its upcoming STS 55 mission have completed freon coolant loop rework and Orbiter structural inspections. In process currently: forward reaction control system electrical connections; freon closed-loop coolant system checkout; main engine mechanical and electrical connections; main landing gear hydraulic system troubleshooting and tile repair. Scheduled tasks: installation of Spacelab-D2 tunnel adapter next week and configuration of the payload bay for Spacelab and its Spacelab tunnel. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 18, 1992.]

□

FERRY FLIGHT & STACKING REPORTS

Discovery is enroute to Eglin Air Force Base in the Florida panhandle to refuel the Shuttle Carrier Aircraft. If the weather is acceptable to continue the ferrying, the Orbiter should arrive at Kennedy Space Center at about 2:30 p.m. Tests appear to show that the problem with the right solid rocket booster (STS 55) is likely associated with ground support equipment. [Halvorson, FLORIDA TODAY, p. 5A, Dec. 18, 1992; SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 18, 1992.]

□

DELTA LAUNCHES SUCCESSFULLY

A Delta 2 rocket, whose launch was delayed twice before, lifted off Launch Complex 17B at 5:16 p.m.; the Cape Canaveral Air Force Station launch had been delayed 12 minutes because of "a minor glitch with range safety equipment." Press spokesman for the Air Force's 45th Space Wing Major Garian Perugini said, "It was a real great way to cap 1992." The mission was the 17th in a series of 24 planned launches of Navstar, a global positioning satellite. [Halvorson, FLORIDA TODAY, pp. 1A-2A, Dec. 19, 1992.]

□

TEST EQUIPMENT BLAMED FOR LEAK

Test equipment has been blamed for a leak of a booster O-ring seal; the seal will not be replaced, according to NASA's George Diller. A final leak check for the Columbia booster will be made early tomorrow. Columbia's STS 55 mission is set for February 1993. [Halvorson, FLORIDA TODAY, p. 2A, Dec. 19, 1992.]

December 21:

STS 54: PROCESSING ACTIVITIES

At Launch Complex 39B, technicians preparing Endeavour for its third Shuttle mission have completed: IUS flight readiness checks; retesting of the IUS range safety hold-fire circuit; calibration of inertial measurement units; crew cabin and aft compartment cleaning; avionics bay closeouts; aft main engine compartment confidence test. Work in progress: IUS ordnance installation; IUS flight battery installation; Space Shuttle vehicle ordnance installation; aft compartment closeouts; preparations for holiday work suspension. Work scheduled: flight readiness review; closing of payload bay doors for the holidays; powering down the Space Shuttle vehicle for the holidays. [SPACE SHUTTLE STATUS REPORT, Dec. 21, 1992.]

□

DISCOVERY MAKES RETURN TO KSC

Discovery, atop the 747 Shuttle Carrier Aircraft, arrived at KSC at 2:41 p.m. EST on Friday [Dec. 18, 1992]. It was demated from the 747 and arrived at OPF Bay 3 at 7:25 a.m. December 19. The Orbiter has been jacked and leveled. The forward reaction control system (FRCS) has been removed and is to be transported to the Hypergol Maintenance Facility (HMF) today. Also in work today is the removal of the ferry flight tail cone. The payload bay doors are being opened for the removal of the airborne support equipment which will be followed by troubleshooting of ODERACS. [Halvorson, FLORIDA TODAY, pp. 1A-2A, Dec. 19, 1992; SPACE SHUTTLE STATUS REPORT, Dec. 21, 1992.]

□

SRB STACKING

In the Vehicle Assembly Building, STS 55 solid rocket booster stacking and leak checks of the left and right boosters was successfully completed December 19. Joint closeouts are in work. Mating the external tank is scheduled to occur when work resumes after the Christmas holidays. [SPACE SHUTTLE STATUS REPORT, Dec. 21, 1992.]

December 22:

STS 54 LAUNCH: JANUARY 13

NASA managers today set January 13th as the official launch date for the first Shuttle mission of 1993. The flight, designated STS 54, has two primary objectives: the deployment of the Tracking and Data Relay Satellite (TDRS-F) and gathering astronomical observations of invisible X-ray Spectrometer (DXS) PAYLOAD. A space walk (EVA) to

evaluate training methods and gain additional EVA experience will also occur during the mission. The launch window for January 13th opens at 8:25 a.m. EST and extends for 2 1/2 hours. The mission duration is planned for 6 days. Landing is scheduled for January 19th at Kennedy Space Center, FL. Commanding the STS 54 mission will be John H. Casper who will be making his 2nd flight. Donald R. McMonagle, making his 2nd flight will serve as Pilot. The three Mission Specialists for Endeavour's third mission are: Mario Runco Jr., making his 2nd flight; Gregory J. Harbaugh, making his 2nd flight and Susan J. Helms, making her first flight. [Banke, FLORIDA TODAY, p. 1A, Dec. 23, 1992; NOTE TO EDITORS, Dec. 22, 1992.]

□

STS 54: IUS ORDNANCE INSTALLED

Technicians at Launch Complex 39B have installed both the IUS ordnance and that of the Space Shuttle Endeavour. They have also installed the IUS flight battery. The IUS flight readiness checks and aft main engine compartment confidence tests have also been completed. Work in progress today: flight readiness review (FRR); aft main engine compartment closeouts; closing of payload bay doors for the holidays at 2 p.m.; power off the Orbiter for the holidays and preparations for holiday work suspension and holiday outages. Technicians will continue aft main engine compartment closeouts and securing LC 39B for the holidays. [SPACE SHUTTLE STATUS REPORT, Dec. 22, 1992.]

□

MCAULIFFE BRIDGE: LOOSE BOLTS TIE UP TRAFFIC

A DOT inspector discovered loose bolts on the north span of the Christa McAuliffe Bridge today and the repairs which followed closed the southbound lane of traffic from the Kennedy Space Center. North and south-bound lanes were alternated during the delay; "they weren't too happy," said bridgetender Joyce Winters. "People probably think, 'What a stupid time to work on this bridge,' but we had no choice in the matter - we didn't want to take any chances." [Martinez, FLORIDA TODAY, p. 2B, Dec. 23, 1992.]

December 23:

STS 54: VEHICLE HOLIDAY CLOSINGS

After yesterday's flight readiness review, technicians at Launch Complex 39B have closed Endeavour's payload bay doors and sealed the crew cabin for the holidays. They conducted a crew cabin leak check and turned the Orbiter's power off. Today, workers are completing aft main engine compartment closeouts and making preparations for holiday work suspensions and holiday outages. Work scheduled: Pad B securing and walkdown for the holidays and Launch Complex 39 facility and annual preventative maintenance. [SPACE SHUTTLE STATUS REPORT, Dec. 23, 1992.]

□

NASA: BUSINESS CONTRACTING GOALS

NASA Administrator Daniel S. Goldin today announced that the agency has exceeded its 1992 goal of awarding 6.7 percent of the total value of the agency's prime and subcontracts to small disadvantaged businesses. Over \$865 million was awarded to minority organizations, representing 7.2 percent of the total \$12 billion awarded during the last fiscal year. In 1990, NASA developed a plan to meet a goal of awarding 8 percent of the total to small disadvantaged businesses (SDBs) by the end of fiscal year 1994. "This represents a major step forward to meeting and, hopefully, exceeding our 1994 goal in 1993," said Goldin. "We are continuing the momentum by recently setting aside appropriate procurements for SDBs, including woman-owned firms, and we are developing an awards program for technical small businesses. I have directed top NASA officials to take steps to substantively increase SDB subcontracting in our top 100

contracts. Also, I have made reaching our 8 percent goal a part of the performance evaluations of NASA's associate and assistant administrators and center directors." [NASA Release: 92-231, Dec. 23, 1992.]

□

MINORITY BUSINESS COMMITTEE ESTABLISHED

NASA Administrator Daniel S. Goldin today announced the names of the Chairman and 23 members selected to serve on the newly-formed NASA Minority Business Resource Advisory Committee. The committee, comprised of members of the business community, will help NASA identify more small, disadvantaged and women-owned firms which potentially could do business with the space agency. NASA has a goal of awarding 8 percent of its contracts to small disadvantaged businesses (SDBs) by the end of fiscal year 1994. "This committee will help to disprove the notion that there are no high-tech small and disadvantaged businesses. We know they're out there, and we'll find them and nurture them because we want to work with firms that have the desire to reach for the American dream," Goldin said in his announcement remarks. [NASA Release: 92-230, Dec. 23, 1992.]

December 24:

ENDEAVOUR PROCESSING SUMMARY

Endeavour is at Launch Complex 39B being prepared for its January 13, STS 54 mission. Work completed prior to the holidays: closure and securing of the crew cabin access hatch; closing the payload bay doors; installation of the aft compartment flight doors and powering off the Orbiter. Work scheduled: resumption of the aft main engine compartment closeouts; loading of mass memory units; installation of EVA spacesuits; installation of flight crew equipment in the crew module; ordnance connections and stray voltage checks; hypergolic tank pressurization; external tank purges; IUS countdown test/guidance system calibration and alignment; TDRS battery charging and DXS interim servicing. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 24, 1992.]

□

DISCOVERY: TAIL CONE REMOVED

Discovery, which is now in OPF Bay 3, has been safed and the hypergolic residual deservicing is complete; the ferry flight tail cone has also been removed. In the OPF, technicians have: removed the forward reaction control system; opened the Orbiter's payload bay doors; removed the USAF airborne support system; Orbiter/ODERACS interface troubleshooting is finished and ODERACS has been removed. Orbiter turnaround activities have been scheduled as has the reconfiguration of the payload bay to receive the ATLAS-2 spacecraft. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 24, 1992.]

□

COLUMBIA: GAS BEAMS INSTALLED

Columbia is undergoing processing for its STS 55 mission which is highlighted by the activities of Spacelab-D2. Work completed: forward reaction control system installation/connects/checkout; OMS pod leak and functional checks; hydraulic system servicing/leak and functional checks; drag chute installation; GAS (Get Away Specialist) beams installed; Spacelab tunnel adapter installation; main landing gear functional test; freon closed-loop coolant system leak checks; main engine mechanical and electrical connections; freon coolant loop rework. Work scheduled: resumption of standard repair work, payload bay cleaning and freon coolant loop functional tests; installation of

Spacelab tunnel and the Spacelab-D2 laboratory module. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 24, 1992.]

December 26:

SR 3 WIDENING TO RE-START

"We feel we have 12 months of work left," said Henry Minneboo, Brevard County's Road and Bridge Division Director. Minneboo referred to the as yet unfinished widening of State Road 3. Kennedy Space Center finished its portion of the widening project on the north end of the road over a year ago. In October of 1991, Brevard County stopped working because the county had failed to obtain the required rights of way to complete the work. Not only will SR 3 be completed by January 1994, according to Minneboo, but other improvements will be made: opening the Barge Canal bridge earlier to permit canal traffic to pass before rush hour; synchronizing traffic lights on SR 3, SR 528 and the Sea Ray boat plant; reducing the number of school bus routes north of the bridge and staggering work schedules of some Sea Ray employees to lessen congestion. The project was originally estimated to cost \$9.4 million; it has already passed the \$12.5 million mark due to the delays and disruptions which have already occurred. A north-bound bridge will begin construction in July 1994. Prior to that, McAuliffe Bridge will be altered to accommodate two lanes of south-bound traffic. [Reitz, FLORIDA TODAY, p. 1B, Dec. 27, 1992.]

December 28:

BASE OPERATIONS CONTRACT EXTENDED

NASA has extended the current Kennedy Space Center Base Operations Contract held by EG&G Florida, Inc., through February 28, 1993. The contract extension also includes four additional 1-month options. The approximate amount of the basic 2-month period is \$32.9 million dollars; the four 1-month options are collectively valued at \$64.4 million. This contract extension is for interim support services during the period of time required to resolve protests of the contract's follow-on competitive award to Lockheed Space Operations Co. [NASA Release: C92-23, Dec. 28, 1992; Banke, (FLORIDA TODAY, p. 10C, Dec. 29, 1992; Date, THE ORLANDO SENTINEL, Dec. 5, 1992.)]

December 31:

SNOOPYS AWARDED

Astronaut Ellen S. Baker has presented Silver Snoopy Awards to Rockwell International employees Keith Pope and William Lester. Both recipients are residents of Titusville, FL. ["Silver Snoopys Awarded," FLORIDA TODAY, p. 9E, Jan. 3, 1993.]

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